MACHINERY ISSUE

THE IRON TRADE REVIEW

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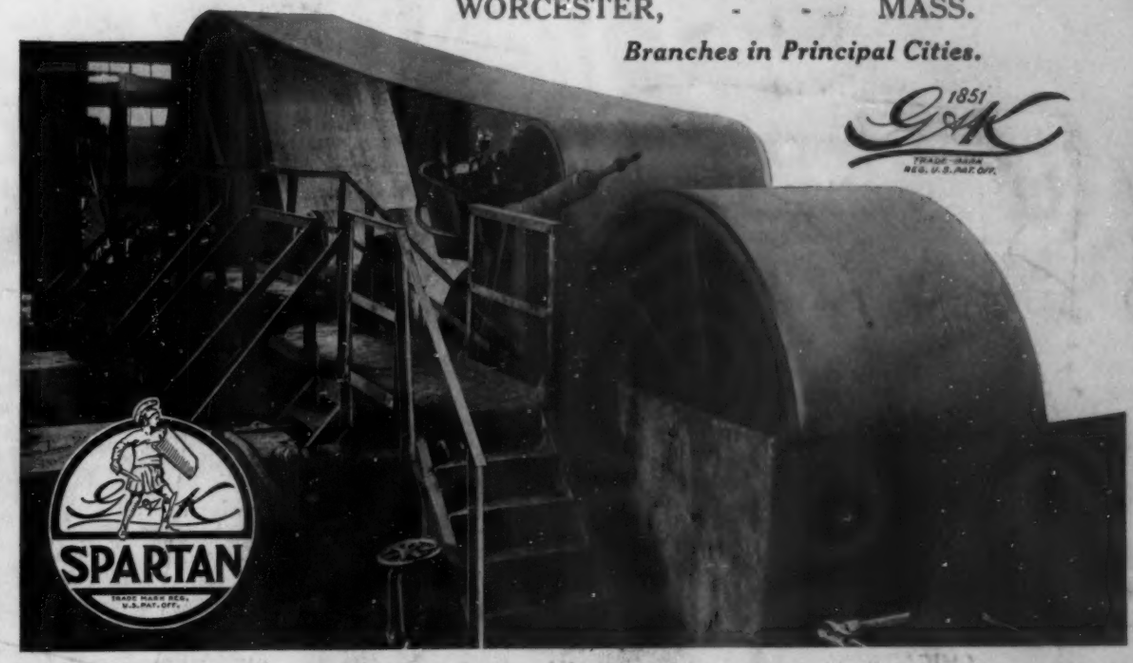
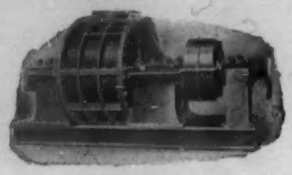


Alphabetical list of Advertisers, page 180. Table of Contents, page 55. "Where-to-Buy," page 120.
Opportunities, pages 173-174-175. Second-Hand Machinery, pages 176-177. Fill-in and Contract Work, page 179.
Manufacturing Sites, page 178. Engineering Directory, page 164.



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Tennessee Coal, Iron Company	Ensley, Alabama
United Steel Company	Canton, Ohio
M. A. Hanna & Company	Canal Dover, Ohio
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THE IRON TRADE REVIEW

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Bright Spots in Labor Conditions

Are Shown in Action of Steel Works Employes and in Liberal Advance of Wages Throughout the Country

LABOR conditions are overshadowing all other features of the market. In spite of the violence which has prevailed at Pittsburgh, the general situation throughout the country is not as alarming as it promised to be a few days ago. The actions of thousands of steelworkers in the Pittsburgh district in heroically defending plants of their employers when attacked by drink-crazed foreigners and others from distant plants, is highly gratifying, and it is confidently expected that labor conditions will steadily improve. Wage advances and numerous forms of rewards for efficiency are being freely granted throughout the country. Pressure for delivery on all kinds of finished materials continues to be very strong and numerous plants are in grave danger of being compelled to greatly curtail production or entirely suspend operations unless deliveries are more promptly made.

Pig Iron

The failure of the pig iron market to keep up in prices to the pace set in finished materials continues to be a rather remarkable feature. In the Buffalo district during the past two weeks, about 165,000 tons of various grades of pig iron have been sold, but a large part of this tonnage was taken at the expense of prices. The Ford Motor Co., Detroit, was able to book about 25,000 tons from Buffalo furnaces for first half of next year at low prices, but Detroit furnaces netted considerably more, on 20,000 tons taken by the same company, and Toledo furnaces declined to meet the Buffalo competition.

Price Advances

Prices have again been advanced on wire products, which have been marked up from $2 to $4 per ton. While a general advance in rivets has not been announced, some sellers have tacked on an additional $5 per ton for contracts for the last quarter of this year, but this advance has not stopped contracting. Contracts for bolts and nuts are being made in a very conservative way with farm implement manufacturers, railroads and other large consumers for the remainder of this year, and with jobbers, up to July 1 of this year. Warehouse prices in New York and Buffalo have been advanced from $3 to $5 on leading products.

Pig Iron Production

April again broke the record for daily average production of pig iron, the average for the month being 107,517 tons, or at the rate of over 39,000,000 tons per year, not including charcoal, which is about 300,000 tons per year. On account of April having only 30 days, the production for the month shows a loss of 102,134 tons, compared with March. The April production was 3,225,496 tons.

Shapes and Plates

Very high prices continue to be asked for anything approaching prompt delivery of plates and even for delivery into the first part of next year some makers are obtaining $80 per ton. Numerous projects calling for structural material are being postponed, but the number of new projects developing is surprisingly large when the high prices and deferred deliveries are considered. In sheets, the demand for heavy gages continues very active, but the prices on the lighter gages are rather weak.

Railroad Buying

Buying of steel rails by the railroads continued at a very lively rate up to the eve of the first day of May, on which the advance of $5 per ton became effective. The sales for April amounted to fully 800,000 tons, equaling the record-breaking tonnage of 800,000 in March. Car buying is of only moderate volume. The Italian government continues in the market for 4,000 cars, a large tonnage of rails and 50,000 tons of war shell steel. The Lackawanna road has asked bids on the new terminal at Buffalo, requiring 5,000 to 10,000 tons. The Lehigh Valley has divided several thousand tons of steel for bridge work between the Pennsylvania and Phoenix companies, and still is in the market for a large tonnage.

Drunken Foreigners Attack Workers

Causing Loss of Life and Property at Pittsburgh

Men in Steel Mills Volunteer to Defend Plants and Are Sworn in as Deputy Sheriffs —Thousands Idle in New York—Cincinnati Machinists Strike

PITTSBURGH, May 2.—The first serious trouble growing out of a series of strikes in the Pittsburgh district occurred this afternoon when at least two men were killed, four fatally wounded and others injured near the Edgar Thomson Works of the Carnegie Steel Co. at Bessemer, Pa., where a mob of drunken foreigners attempted to force an entrance to the plant. Plant guards, armed with riot guns, fired into the mob after one of the strikers had fired into the plant. Men at the plant are not on a strike.

Many of the men taking part in the riots are striking employes of the Westinghouse companies who organized the processions to march to the steel plants.

Governor Brumbaugh ordered the Eighteenth infantry, National Guard, the governor's troop, Sheridan troop, Sunbury troop and H troop of cavalry for immediate duty in Braddock and vicinity.

Thousands of women and children living in the strike zone were thrown into a state of consternation, when a reign of terror started yesterday afternoon. Had the national guard been called out last night, it is believed that trouble today could have been avoided.

The riot this afternoon at the Edgar Thomson works was the culmination of a series of lawless attacks made on Turtle creek and Monongahela valley plants yesterday afternoon and this morning. A mob of foreigners charged plant after plant. Carrying red flags, drunken members of the mob marched through plants of the Carnegie company, the American Steel & Wire Co., the Columbia Steel & Shafting Co., the McClintic-Marshall Co., the Nicholson Chain Works, and numerous other plants, none of which has had any labor trouble.

Men at some of the plants were driven, under threats, from their posts of duty. Switches controlling electrical equipment were reversed or thrown into neutral without warning. Strikers, unchecked by the law, declared they would close every plant in the valleys. By 1 o'clock this afternoon, the mob, increased to 2,000 shouting men and boys, armed with clubs, pick handles and stones, continued its ruthless march through several more plants, forcing workmen from their positions.

Paul Cinak, 21 years old, alleged leader of one of the mobs in the Rankin-Braddock district, was arrested by deputy sheriffs this morning and taken to the county jail.

Fearing a repetition of mob violence, officers of the American Steel & Wire Co., and the McClintic-Marshall Co. closed down their plants at Rankin and Braddock, to protect employes. The Mesta Machine Co., West Homestead, closed down its works, to avoid disturbance and violence. Labor agitators have planned to lead delegations to Homestead.

Workers as Guards

Already 100 Edgar Thomson workmen who volunteered to protect the plant have been sworn in as deputy sheriffs, and similar action has been taken by the Carnegie company in its Homestead mills. The men are not armed.

The riot at Braddock was the climax of a day of disorder in the boroughs of Braddock and Rankin during which mobs stormed the plants of four big steel companies, drove the workmen out and then partly wrecked the interior of the plants. Many of those injured in the fighting at the Edgar Thomson works were spirited away by the rioters and for hours after quiet had been restored, injured continued to be brought to hospitals for treatment.

Snippers hidden in doorways and windows near the Thirteenth street entrance tried to pick off deputies who were fighting to hold back the mob and two deputies were said to have been hit. Women also joined in the mad fight to gain entry to the works and two of these were wounded. The two men killed were foreigners.

The mob first attacked the office of W. J. Dixon, superintendent of transportation at the Edgar Thomson works, and with clubs and stones wrecked it.

The movement started early in the day when a procession was organized by Westinghouse Electric & Manufacturing Co. strikers at East Pittsburgh to continue their efforts to bring out the workmen in the other factories of the Turtle creek and Monongahela valleys in support of their demand for an 8-hour day.

They had been defeated in a similar attempt yesterday and the marchers were angry when they set out. Pickets, who had been stationed at a number of Braddock factories, had been worsted in encounters with workmen as the men were going to work. The plants of the American Steel & Wire Co., a United States Steel Corporation subsidiary, and a number of other plants had been shut down as a protection to the employes the management announced.

Other plants continued to operate, however, and when the news was brought to the marching throng that the steel workers would have none of them, the route was changed and they stormed the buildings of the Sterling Steel Foundry Co., whose employes have been working eight hours a day for some time.

New York Harbor Tied Up

New York, May 2.—With the advent of the month of May, the strike movement, which lately has been of increasing dimensions throughout the east, is extending to a great many different industries and is rendering idle, workers numbering hundreds of thousands. In this city, some 60,000 cloak makers went out on strike today, in retaliation for the decision of the employers hereafter to conduct open shops and to employ whom they please, without dictation from the union. The manufacturers claim they are determined to gain their point, and a number of them threaten, in the event of possible failure, to remove their plants from this city. It is considered likely that the strike may prove of considerable duration.

New York harbor practically is tied up by the strike of tugboat and steam lighter engineers which was called yesterday. Of the 750 tugboats in this port it is estimated that only about 50 are at work, and the same large proportion of the lighters are idle. The congestion of freights at the deep water terminals, which already had been serious enough by reason of the scarcity of vessels, now is more acute than ever before in the city's history. Yesterday, owing to the lack of tugs, about 2,000 coastwise vessels were delayed in leaving port, while ocean-going vessels in most cases are compelled to get into and leave their berths unaided. The situation has been rendered still more serious by

(*Continued on page 976.*)

Shell Makers Purchase Fewer Tools

Foreign Sales Decrease as Domestic Needs Mount—Railroads Contribute Heavily to Total—Labor Troubles Occupy Builders' Attention

MACHINE tool manufacturers are practically unanimous in reporting that the volume of business booked during April was more satisfactory than during the preceding months. This was due to a diminishing demand from abroad and from munition makers in this country, which, however, was counterbalanced by increased sales to miscellaneous domestic consumers. Business during the month, therefore, assumed a more normal character. One machine tool interest, for instance, states that his foreign business, which a few months ago formed 75 per cent of that company's sales, now constitutes only about 25 per cent. The heaviest foreign buying during the month was consummated by representatives of concerns which are engaged in the manufacture of munitions in Russia, and included in this total were large numbers of small-swing lathes. The larger portion of this Russian business was placed by the Allied Machinery Co. of America, 120 Broadway, New York, which is acting in the interest of several Russian concerns. Leonid Smugge, general manager of the Michelson Works, Moscow, Russia, who is staying at the Hotel McAlpin, New York City, placed important orders. Scattered inquiry continued to develop during the month from England, France and Italy. Included in the French business was a large order for rifle machinery. A good sized miscellaneous business was booked. A comparatively new field was opened up through the placing of an order for a Chilean concern; the Argentine Republic and other South American countries also entered the market. One seller reported that for the first time in a long while, an order had been booked for Cuba.

Munition Makers Active During Month

Considerable further interest in reference to new contracts for munitions, developed during the month. Among the features in this connection, were the activities of brokers who claimed to be authorized to dispose of contracts. One broker, for instance, canvassed a large number of manufacturers claiming to be authorized to place a contract involving 5,000,000 6-inch shells for the British government. Several concerns, including the American Steel Foundries, placed extensive orders for large-swing lathes for making 9.2-inch and 12-inch shells. A steady demand for such equipment came from certain Canadian interests who recently have booked shell contracts. The needs of time fuse manufacturers also were responsible for considerable activity in the machine tool market. The International Arms & Fuse Co., New York; the Neptune Meter Co., through its subsidiary, the Liberty Arms & Fuse Co., Long Island City; the Keystone Watch Case Co., Riverside, N. J.; the Steneotype Co., Indianapolis, and a number of other concerns closed for large quantities of equipment for manufacturing time fuses.

Railroads Contributed Heavily

The market was featured by heavy buying on the part of the railroads throughout the country. The Chicago, Burlington & Quincy, the Chicago & North-Western, the Union Pacific, the Illinois Central, the Philadelphia & Reading, the Baltimore & Ohio, the Pennsylvania, the Erie and other carriers, issued important inquiries, of which early distribution is expected. The New York Central placed the major portion of the tools involved in a large list issued several months ago and it is expected the remainder of the business will be placed shortly. The Cincinnati, Hamilton & Dayton, the Midland Valley, the Santa Fe, the Norfolk & Southern and the Indiana Harbor Belt railroads all issued important inquiries, subsequently distributed, which formed a large volume of business in the aggregate.

Domestic sales aside from railroad buying were of a sustained character. The most important buyers were the automobile builders and automobile accessory manufacturers, most of whom are extending their capacities. Good orders came from practically all lines of industry. Among this miscellaneous buying were large orders from some of the ship building companies. In this connection, a feature of the month was the announcement of the plans of the Sun Co., Philadelphia, which is to begin work immediately on the construction of a new huge ship yard at Chester, Pa. This interest is inquiring for a large amount of equipment which is expected to be placed shortly. Steel companies during the month bought machine tools on a larger scale than ever before.

Labor Difficulties Looming on Horizon

Labor troubles assumed larger dimensions during the month. Fresh strikes broke out at a large number of plants throughout the east and middle west, particularly in New England, New Jersey, Pennsylvania and Ohio manufacturing centers. The most important strikes were those at the Westinghouse plants in the Pittsburgh district, which have not yet been settled. Manufacturers, generally, are uneasy because of the threats of union officials to bring about another general strike movement, such as that which featured the summer and fall of 1915. It is interesting to note, however, that a great many of the shops whose operations were most seriously interfered with by the strikes last year, now are employing more men than before the strikes were called and are making better deliveries than at any time since the war broke out.

The question of deliveries constantly is becoming less important and on a great many of the tools which a few months ago were sold far into the future, it now is possible to get deliveries within 10 or 15 days. Large lathes and planers, turret lathes, automatic screw machines, cylindrical and surface grinders, milling machines, boring mills, rifle machinery, etc., continue to be sold ahead for several months by some manufacturers, while others are capable of giving better deliveries. The railroads have made much progress in clearing up the congestion of freight on their lines, with the result that delays in shipments due to embargoes were not experienced so severely as in previous months.

THE OPEN HEARTH

Important Features of the Convention of National Metal Trades Association—Labor Troubles and Their Solution

WHEN the meeting of the National Metal Trades Association was held in April, last year, there had been very little actual improvement in business, after the period of profound depression which followed the beginning of the European war. The very week that the convention was held last year, it was announced that the efforts of the United States Steel Corporation to maintain mill wage schedules despite adverse business conditions had proved futile to a considerable extent, as shown by the action of the American Sheet & Tin Plate Co. in announcing a wage cut in the hot mill departments of its sheet and tin plate plants throughout the country. There was, it is true, a feverish speculative condition in the stock market, but business dragged. What a striking contrast was presented last week when again the members of the Metal Trades Association assembled in New York! They found that, following a sudden reversal in business conditions, bringing about the greatest period of activity in the history of its members, they were confronted by unusual and very great difficulties, the principal one of which was due to the restlessness and excessive demands of labor. Of course it was to be expected that with the return of prosperity the workingmen would demand advances in wages, and it was only just that these should be granted to a reasonable extent, but the agitation for the eight-hour day was found to be the greatest menace to industry. Secretary Morrison, of the American Federation of Labor, in discussing the demand for the eight-hour day, said last Saturday:

"Thinking men are agreed that long hours are economical for no one. Physicians are agreed that long hours exhaust the body cells, making it impossible for them to function, thereby destroying the man's vitality. Workers will continue agitating, organizing and striking until the eight-hour day is assured."

If the present movement were genuinely one for eight hours, it would have the hearty sympathy of vast numbers of people who are not in any way connected with the unions. But the fact is that although some individuals are sincere in advocating the eight-hour day, the movement on the whole is not for shorter hours, but for higher wages. It is a movement founded on a hypocritical pretense. This fact is shown conclusively by the reports and discussions which took place at New York. Not many workingmen are worrying about "exhausting the body cells" or being overcome by physical or nervous prostration. They are thinking about the money that they believe they will be able to force employers to pay them. They are victims of the money-making craze which is sweeping over the country and is not confined to any particular class of men. If the men would come right out and say frankly that what they want is overtime rates, they would be entitled to more respect. We believe that the association is entirely right in taking a position in favor of granting reasonable increases by rewarding individual merit and by granting bonuses and premiums for efficiency.

Attention was very appropriately called to the excellent work which was done by Walter Drew, as counsel of the joint committee appointed to follow the hearings of the industrial relations commission, of unsavory memory. Of course all of the members of the commission were not as unreasonable as Chairman Walsh, but it required a master of diplomacy to mingle with the members and have any good influence upon them. Mr. Drew is heartily to be congratulated upon even the moderate success which rewarded his efforts.

Naturally, and very properly, the Tavenner bill was denounced and the attitude of Secretary Baker in arraying himself on the side of those who favored efficiency methods was heartily approved. We trust that similar resolutions will be adopted by business organizations throughout the country. If, when they do a good thing, public officials could be made to understand that their course is approved by the business men of the country, it would be a comparatively easy matter to obtain just legislation and to defeat the vicious kind.

As usual, James A. Emery, brilliant counsel of the National Council for Industrial Defense, made an address which commanded close attention, describing the perils which may be connected with the struggle for industrial supremacy after the end of the great European war.

A rather unexpected, but very interesting feature was the protest against the efforts of the director of the bureau of standards and others to obtain the passage of laws to substitute the metric system for the present standard of weights and measures. The clear thinking and vigorous speaking of F. A. Halsey, editor emeritus of the *American Machinist*, constituted a powerful factor in inducing the convention to adopt a resolution on this subject. In his long, active editorship of the *Machinist*, Halsey rendered

THE OPEN HEARTH

high grade service in many ways, especially in helping employers to decide how to compensate their employes, and it is pleasing to know that he still takes a lively interest in the association.

While, owing to the seriousness of the labor situation, less time was devoted than in previous conventions to discussing industrial education and co-operation of the various organizations of employers and all kinds of matters of mutual interest, these subjects were by no means forgotten and one of the most hopeful features of the convention was furnished by the report of Mr. Alexander, indicating that some day there may be an American federation of employers in this great country. Hasten the day!

"Always Bad for a Man Not to Do His Best," Says Secretary Baker in Opposing the Tavenner Bill

SECRETARY OF WAR BAKER, in his letter to Speaker Clark, in regard to time studies and premium payment in government employment, makes a remarkably strong and absolutely convincing argument against the Tavenner bill and all similar attempts to exclude efficiency from government plants. Although new to the office of secretary of war, Mr. Baker shows that he has not been a stranger to the controversy relating to efficiency and that he has a perfectly clear understanding of it.

After the secretary's letter was made public, the central labor union of the city of Washington adopted resolutions endorsing the Tavenner bill and asserting among other things that, "the Taylor system and similar systems of shop management, sometimes miscalled scientific management, contemplate the introduction in work shops of such practices as elemental time study with the stop watch, premium systems and other devices calculated to place the workman absolutely under the control and at the mercy of the employer to speed up workmen, substitute cheap labor for skilled labor, intensify competition and the struggle of life for laboring people, destroy trade lines and disrupt organized labor." This is the old familiar argument of the labor union and shows that even when a man like Mr. Baker, who has been a real friend of union labor, shatters the old arguments, labor agitators again bring them forth. To listen to these agitators talk, one would think that every workman under the Taylor system would have standing over him constantly a slave-driver with a club in one hand and a stop watch in the other. This is, of course, absolutely absurd and Mr. Baker shows that the watch is used only in the study of a new job, for the purpose of working it out correctly and for assigning the proper time for its performance. He also asserts that the use of the watch is becoming less frequent all the time, as information which has accumulated makes such study unnecessary. He refers to facts relating to the success of the efficiency method at the Watertown arsenal and shows that charges that the work is unduly severe are false.

Taking up the relation of employes to production, Secretary Baker declares that inefficient production is bad for the operator. Here is a sentence which ought never to be forgotten:

"It is always bad for a man not to do his best, not to make the most of his opportunities and of his labor, and to produce less than he can under a system of proper inducements and compensations."

In other words, the secretary puts himself squarely in opposition to loafing on the job, or doing slovenly work, or engaging in any other pastime or practice that prevents a man from doing his level best. Of course, he recognizes that there is such a thing as over-work. He says there is no question that the whole nervous and physical system of the operative is imperiled, and his strength, as a part of the national strength, decreased, if he is either urged or induced to work beyond a sound physiological maximum. There is a slave-driver among employers now and then, but a very great majority of the men who hold responsible positions at the head of manufacturing concerns are reasonable human beings, and for selfish, as well as altruistic reasons, have no desire to compel their employes to do more than they are able to do without sacrificing health and happiness. They will thoroughly agree with Secretary Baker when he says:

"It is bad for the national life, for its industrial efficiency, and for its squareness to have its component parts, whether they be operatives in an industrial plant, professional men, or public officers, turning into the aggregate either a product so excessive that it represents a deterioration in their physical and nervous strength, or a product so insufficient as to represent less than their honest and safe best."

The question now put squarely before congress is: Will the absolutely sound arguments made by Secretary Baker and many others, including the eminent engineers who have written for *The Iron Trade Review* in opposition to the Tavenner bill, prevail, or will members of congress cringe beneath the lash of labor agitators—*the fellows who are trying to prevent men from doing their best?*

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products May 3, average for April, 1916, average for February, 1916, and average for May, 1915. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices May 3, 1916.	Aver. for Apr., 1916.	Average for Feb., 1916.	Aver. for May, 1915.
Bessemer pig iron, Pittsburgh	$21.95	$21.95	$21.45	$14.58
Basic pig iron, Pittsburgh	18.95	19.20	18.77	13.54
No. 2 Fdy. pig iron, Pittsburgh	19.70	19.45	19.51	13.45
Northern No. 2 Fdy., Chgo.	19.00	19.00	18.50	13.00
Lake Superior Charcoal, Chgo.	19.75	19.75	19.50	15.25
Mall. Bess., Chgo.	19.50	19.50	19.00	13.00
Southern No. 2, Birmingham	15.00	15.00	14.75	9.75
Southern Ohio No. 2, Ironton	18.50	18.50	18.00	12.56
Basic, eastern Pa.	20.50	20.50	19.50	13.50
No. 2X Virginia furnace	18.50	18.00	18.00	12.50
No. 2X foundry, Philadelphia	20.75	20.75	20.00	14.00
Ferro mang., Balti., (1917)	175.00	175.00	135.00	100.00
Bessemer billets, Pbgh.	45.00	45.00	34.00	19.50
Bess. sheet bars, Pbgh.	45.00	45.00	35.00	20.00
Op.-h'th sh. bars, Pbgh.	45.00	45.00	35.00	20.00
Open-hearth billets, Pbgh.	45.00	45.00	34.00	19.50
Steel bars, Chgo.	3.10	3.00	2.25	1.39
Steel bars, Pittsburgh, contr.	2.50	2.50	2.01	1.20
Iron bars, Philadelphia	2.559	2.559	2.559	1.20
Iron bars, Cleveland, local del'y.	2.40	2.40	2.29	1.15
Iron bars, Chgo. mill	$2.35	$2.35	$1.91	$1.15
Beams, Chgo.	3.10	3.00	2.25	1.34
Beams, Pittsburgh, contr.	2.50	2.50	2.03	1.20
Beams, Philadelphia	2.659	2.659	2.259	1.30
Tank plates, Pbgh., contract	2.90	2.67	2.13	1.125
Tank plates, Chicago	3.50	3.35	2.33	1.29
Tank plates, Philadelphia	3.909	3.809	2.659	1.30
Sheets, blk., No. 28, Pbgh.	2.90	2.90	2.60	1.80
Sheets, blue an., No. 10, Pbgh.	3.00	3.00	2.61	1.35
Sh., galv., N. 28, Pbgh.	5.00	4.89	4.75	3.40
Wire nails, Pittsburgh	2.50	2.40	2.22	1.55
Connellsville fur. coke, contr.	2.90	2.98	2.50	1.65
Connellsville fdy. coke, contr.	3.50	3.50	3.75	2.25
Heavy melting steel, Pbgh.	17.25	18.12	17.37	11.75
Heavy melting steel, east'n Pa.	17.50	17.75	16.50	11.50
Heavy melting steel, Chgo.	16.75	16.75	15.25	9.25
No. 1 wrought eastern Pa.	23.00	23.00	22.50	12.50
No. 1 wrought, Chgo.	16.75	16.75	14.93	8.75
Rerolling rails, Chgo.	17.75	17.90	17.15	10.00
Car wheels, Chgo.	13.50	14.00	14.00	9.75

(For Additional Prices See Page 1020.)

Buffalo Iron Developed Weakness

And Large Tonnages Were Sold, But the Market is Now Somewhat Stronger—Prices in Most Centers Firm

Buffalo, May 2.—Furnaces of the Buffalo district in the past two weeks have booked orders for a total of approximately 165,000 tons of iron of the various grades, the deliveries in some cases being extended. It now appears that the sales for a week ago, according to later advice, totaled about 125,000 tons instead of 90,000 to 100,000 tons, as previously reported. The total sales for the past week have amounted to 35,000 to 40,000 tons and the producers report there remains in the market an inquiry for about 10,000 tons additional. This heavy selling, together with the previous heavy booking by the Buffalo stacks, means that it is going to be a difficult matter to secure much more iron for delivery over the remainder of the year produced in this district.

During the active sales period price schedules as quoted for several weeks were shaded, but one or two interests in the last week have stiffened their schedules to a point where a minimum of $19 is being asked for any grades.

Concessions Important Factor

New York, May 2.—Buyers of iron have continued to come out actively for their requirements for the last half of this year and the first six months of next. Sales of the past week in this district have been heavy.

What proportion of this business has been stimulated by the offering by Buffalo furnaces of prices for first half of next year, 50 cents to $1 under the last half schedule, or at $18.50 to $19, for No. 2X, cannot be approximated but these concessions, undoubtedly, have been an important factor. Makers explain their action by the desire to take on a backlog of orders for next year at this time. Recent buying of the American Radiator Co. for next year's delivery is reported to have been on the $18.50, Buffalo, basis. For this year, Buffalo makers have been entering business at $19 to $19.50, furnace, for No. 2X. Some iron in Connecticut territory went under $18.50, Buffalo basis, but this is reported to have been taken by lake makers farther west.

Eastern Pennsylvania makers are not seeking next year's business and are holding this year's iron firmly at $20 to $20.50, furnace, for No. 2X. The Eastern Malleable Iron Co., which was reported a week ago as figuring, has closed with Buffalo makers for 10,000 tons of malleable for the first half of 1917. Reports of heavier tonnages taken by this buyer are not confirmed. A quiet sale of 7,500 tons of foundry was put through here. Other sales this week include about 2,000 tons to the New York Air Brake Co. for this year, with 2,000 tons or more pending for next year; 2,000 tons to a local buyer for western shipment; 1,000 to 1,500 tons to Harrison, N. J.; 1,000 tons to New Britain, Conn.; 1,000 tons to another Connecticut point; 500 to 1,000 tons to Newark, N. J. A new inquiry for 3,000 to 5,000 tons of foundry for a Connecticut buyer for next year is current. Government navy yards are inquiring for about 2,000 tons of charcoal and foundry iron for bids May 2 and 9. A heavy export inquiry for iron remains unclosed, this including the large lots of bessemer for France inquired for by J. P. Morgan & Co. and of low phosphorus for the far east. Complaints of labor shortages among the foundries are quite general. Some plants are unable to operate at more than two-thirds of their capacity by reason of this fact.

(*For complete prices see page* 1020.)

Little New Business

Philadelphia, May 1.—New business in pig iron in this district has quieted down considerably and the market has

been almost dull. Pending inquiry is meager. Uncertain labor conditions at this time appear to be exercising a deterrent influence and buyers seem to be awaiting the developments of the next few weeks. The Reading Iron Co., it now is learned, has made further purchases of about 5,000 tons against its recent inquiry for 10,000 tons of shop forge and practically has satisfied this requirement in full. The Bethlehem Steel Co. has made no further purchases of basic, but it is learned it recently closed for about 4,000 tons of low phosphorus iron of which it is regularly a buyer. An eastern Pennsylvania iron mill which recently asked for some special basic bought 1,000 tons for nearby at about the ruling standard forge price. Another eastern Pennsylvania puddling works is closing on 1,000 tons of forge. Some eastern Pennsylvania makers of mill forge iron are asking $20, furnace, but this grade still may be had at $19, furnace. Basic is inert with no inquiry and with minimum prices of about $20.50, delivered, eastern Pennsylvania. On an export inquiry for 3,000 tons, eastern makers named $20.50, furnace. Northern foundry iron prices rule from $20.50 to $21, Philadelphia, for No. 2X on the average. An export inquiry for 4,000 tons is current. In Virginia iron, shipments are heavier, due to improved traffic conditions, but there is little new buying. It is believed that the 95,000 tons in stock in Virginia on April 1 were reduced during the past month; similarly that the unfilled orders, which had been at 270,000 tons, had been reduced. Prices are unchanged. Some 5 per cent Virginia iron is being offered at $21.50, furnace. Low phosphorus sales of the week were lighter, totaling about 1,000 tons of standard. Prices among eastern producers remain as formerly. Canadian buyers are taking shipments of this grade actively and continue to buy liberally. About 15,000 tons for export to the far east are unplaced. Some unusually low prices on Buffalo spot malleable below standard in some slight particulars are reported to have been made in this district, the figure being considerably under $18, furnace. The Oxford, N. J., furnace has resumed. In Virginia, another Low Moor and the Iron Gate stacks soon will be started.

Averages Decline

Pittsburgh, May 2.—Heavy buying of steelmaking pig iron by the Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. caused average prices of bessemer and basic grades to register declines in April. According to figures compiled by W. P. Snyder & Co., the average prices of bessemer and basic pig iron in April were $20.70 and $18, valley, respectively. Compared with averages for the preceding month, bessemer iron declined $0.1625 and basic declined 25 cents a ton. About 100,000 tons of bessemer iron and about 20,000 tons of basic iron figured in the averages.

Pending inquiries for bessemer iron for domestic consumption involve about 20,000 tons. While most purchases of large tonnages have been bought on the basis of $21, yet considerable iron has brought $21.50, valley. The United Steel Co., Canton, O., has taken 5,000 tons of basic iron from a nearby furnace at $18.50, furnace; this figure is equivalent to less than $18.25, valley. Two car builders in the Greater Pittsburgh district have closed negotiations for a total of 5,000 tons of malleable iron for prompt and third quarter delivery at $18.50, valley. Scattering lots of No. 2 foundry are being sold at a range from $18.50 to $19, valley. A pig iron interest in the Chicago district is offering low phosphorus pig iron for prompt delivery in this territory.

Bessemer for Export

Youngstown, O., May 2.—The Brier Hill Steel Co. has sold the last of the big tonnage of bessemer iron that it had been carrying in stock. This sale, which is for about 10,000 tons, has just been made for export. While not confirmed, the belief is freely expressed that this lot was taken for shipment to France, as part of the negotiations that French representatives have been conducting in this country for that grade. The iron is for immediate shipment, the price being understood to have been slightly above the present market. The Brier Hill company has had a large stockpile of this iron some time, all of which has now been sold. Little activity is apparent in other grades. It is anticipated that a buying movement in steelmaking grades will develop within eight or 10 weeks.

Chicago Market Active

Chicago, May 2.—Although no change in prices has been made in the Chicago district, pig iron continues strong and the tendency toward higher levels continues. Inquiry remains strong and in view of the fact that continued selling is the rule, this means that a large tonnage is being taken in the aggregate.

Northern No. 2 foundry continues at $19, Chicago furnace, and malleable at $19.50, furnace.

Considerable buying of basic iron has been done recently, interests at St. Louis having taken tonnages from a steel stack in this territory at a price concession. Some tonnage of basic is still under negotiation and probably will be closed shortly. The basic iron is for delivery during last half of the present year.

A radiator interest is in the market for an indefinite tonnage of southern foundry iron and apparently has been obtaining concessions, as quotations at the quoted level have not obtained any portion of this business.

Southern iron is quoted by most sellers in this territory at $15.50 for prompt delivery, $15.50 to $16 for last half, and $15.75 to $16, Birmingham, for first half of 1917. It seems probable that tonnage is being placed at $15 for prompt delivery and $15.50, Birmingham, for last half of this year may be done in a number of quarters.

Among the surprising side lights on the present market, is the action of one Jackson county furnace in holding its high silicon iron for last half at $29, furnace, and being willing to take some tonnage at $27, furnace, for delivery during first half of 1917. Other makers in Jackson county are asking at least the same price for last half of this year on whatever tonnage they are willing to take for next year.

No change has been made in quotations on Lake Superior charcoal iron, and, although considerable selling is being done, the present output is heavy and perhaps nearly equals shipments.

Ford Company Buys

Cleveland, May 2.—The Ford Motor Co., of Detroit, has purchased about 45,000 tons of No. 1 pig iron for delivery during the first half of next year. The delivered price, Detroit, was about $20.60. Approximately 20,000 tons will be furnished by Detroit furnaces, while about 25,000 tons will come from Buffalo furnaces, sold at about $18.75, furnace. This transaction indicated that the Detroit and Toledo furnaces are quoting on a higher basis than some of those at Buffalo. A fair tonnage of malleable has been sold at Buffalo at about $18.50, furnace. Sales of Cleveland agencies for April make a good total. One firm sold over 150,000 tons and its shipments were about 20,000 tons in excess of its make.

Quiet at Cincinnati

Cincinnati, May 2.—Sales of pig iron are low. General inquiry is at minimum and even prospective business that has been secured through private solicitation has fallen off since last week. Southern iron shows no tendency to advance, although it is

(*For complete prices see page* 1020.)

still too low in comparison with the present prices of northern iron. A few lots of southern No. 2 foundry have been sold for shipment through the remainder of 1916 at $15, Birmingham basis, but the price usually asked for that delivery is $15.50. The quotation for the first half of 1917 is from $15.50 to $16. Several southern furnaces are extremely anxious to add to the tonnages on their order books and are actively soliciting every inquiry. Silvery iron made in this territory is quoted at from $27 to $29, furnace, for 8 per cent silicon. It is reported that this minimum figure has been shaded by one stack to some special customers.

Firmly Settled

Birmingham, Ala., May 2.—The Birmingham iron market remains firmly settled at $15 and $15.50 for spot and second half and no disposition to quote higher except on the part of one interest, which asks $15.50 for both deliveries and does sell small quantities of spot at that figure. The Tennessee company has taken on another large tonnage of basic, but, outside of 1,000 tons for middle western delivery, very little has been done in the foundry trade. Iron is being ordered out on time and in some instances ahead of time, but an intermittent car shortage keeps down the volume of movements. Inquiries are more in evidence, some of them being for 1917 delivery. Quotations for that period are $16 for first half. Little, if any, business has been done. The general southern foundry trade demand is picking up, especially in Texas, where shops of all kinds are operating on full time.

Government Buying Bars

Texas Company is Lowest in Reinforcing Material—
High Quotations on Large Rounds for Forging

Philadelphia, May 1.—On 3,000 tons of reinforcing bars for third quarter delivery for the Panama canal, the Texas Rolling Mill Co. of Ft. Worth, Tex., submitted the lowest figure of 3.28c, base, delivered. The Bridgeport Screw Co., bidding for the Peck Rolling Mill Co., of Montreal, quoted 3.40c, and the Concrete Steel Co., for the Carnegie Steel Co., 3.65c, both base delivered. The United States Steel Products Co. offered 127 tons from Waverly at 3.80c, delivered, for 40 days shipment; 127 tons from Baltimore, at 3.815c, delivered, for 50 days' shipment, and 133 tons from Pittsburgh, at 3.95c, delivered, for 50 days' shipment. On a miscellaneous tonnage of steel for eastern and western navy yards, the Carnegie Steel Co. named from 2.60c to 3.60c, base, Pittsburgh, for the common sizes of bars. On large rounds for forging, the company named 6.75c, mill, the Bethlehem Steel Co. 5.00c, mill, and the Erie Forge Co., 12.00c, mill. New buying of soft steel bars remains light because of the indifference of makers to sales, with prices ruling from 2.50c to 3.00c, Pittsburgh. An eastern Pennsylvania maker is offering a moderate tonnage of shell bars for fourth quarter delivery and has quoted up to 4.50c, mill, on this material. The pending inquiry for shell bars remains heavy.

Large Contracts Reported

New York, May 2.—Not so much new inquiry for shell bar steel has been coming out the past week, but the market still shows several hundred thousand tons for this year's delivery for which mill capacity is sought. Very few makers continue able to offer more than odd tonnages for delivery this side of January. A report is current, however, that one contract of 50,000 tons has been placed with a western mill. The market on large steel rounds for shell purposes continues to be regarded from 3.75c to 4.75c, mill.

Large French Orders

Pittsburgh, May 2.—The Carbon Steel Co. has received an order for 30,000 tons of rounds for the manufacture of shells for the Italian government. Billets for the order will be furnished by Corrigan, McKinney & Co., Cleveland, and the rounds will be rolled in works of the Carbon company in this district. While the market for rounds for the manufacture of shells is not nearly so nervous nor excited as it was a few months ago, yet orders in the aggregate are as heavy as at any time since the outbreak of the war in Europe. Steel bars for domestic delivery are being held at 2.50c for shipment at the convenience of the mill, but material for nearby shipment is commanding premiums ranging from $5 to $15 a ton.

Many Expedients

Chicago, May 2.—Strength of steel bars for all purposes remains undisturbed, and while high prices and remote delivery have reduced insistent demand, enough remains to keep up full strength of the market. The nominal quotation is 2.69c, Chicago mill, but sales well above 3c, Chicago mill, have been made and many expedients have been resorted to by consumers to obtain supplies much needed for their operations.

(*For complete prices see page* 1020.)

Bar Iron Easier

Chicago, May 2.—Although demand for bar iron continues excellent and mills are booked for several months, third quarter iron can be contracted at 2.35c, Chicago mill. Some makers have been asking 2.50c, Chicago mill, for this material, but under present circumstances will take the lower quotation, if they are willing to entertain the business at all. Current tonnages for delivery up to July 1 are steady at the lower quotation.

Hoops and Bands

Pittsburgh, May 2.—Manufacturers continue to offer steel hoops at 2.75c and bands at 2.50c for delivery at their convenience. Deliveries of both products are deferred from nine to 12 months and makers would have no difficulty in obtaining attractive premiums if they were able to promise prompt shipment.

Makers of cotton ties are reluctant to say anything about prices for the 1916 season, and it is not likely that the market will be opened for at least a month.

Shafting

Pittsburgh, May 2.—Several minor changes have been made in the standard list and classifications of extras on cold finished steel and shafting by all manufacturers of these products. The revised list affects odd and intermediate sizes. Cold-rolled steel shafting in carload lots is selling at a range from 10 to 20 per cent off the list. Smaller tonnages are being sold at as high as 20 per cent on the list, the equivalent of $120 a ton.

Boiler Rivets

Are Marked Up $5 Per Ton for Last Quarter of This Year

Cleveland, May 2.—Contracts for boiler rivets are being made on the basis of 3.85c for third quarter and 4.10c for the last quarter of the year. The 3.85c, announced last week, was an unprecedentedly high quotation, but the addition of $5 more for the last quarter of 1916 has not stopped contracting.

Fire destroyed the plant of the Delta Electric Co., Marion, Ind., last week, causing a loss of approximately $30,000.

Billets Sold

By Eastern Producers to Mills in Pittsburgh District

Philadelphia, May 1.—Reports have been in circulation of sizeable sales of billets having been made by eastern producers to large steel companies in the Pittsburgh district. While some such transactions have been made, they have not possessed the importance or the significance ascribed to them by some of the rumors, and in fact, the buyers have not been the companies mentioned in the latter. One small sale of seconds was made by an eastern Pennsylvania maker to an eastern plant of a large steel producer. An eastern Pennsylvania rolling mill is in the market for 3,000 tons of 4, 5, 6 and 7-inch billets for the remainder of the year and another eastern mill for 300 to 400 tons of 4 by 4-inch either bessemer or open hearth. Eastern consumers recently offered billets from the Chicago district at about $54, delivered, have evinced little interest. Buffalo open hearth billets are being offered here at $50, mill, or about $52.70, delivered. Leading eastern makers ask from $50 to $55, mill, for rerolling and $65 upward for forging billets. On a small lot of forging billets, $75, mill, was named this week. In some directions deliveries have improved. There has been further buying of discards from large rounds for rerolling at $38 to $39, delivered, in this territory. A price of 3.84c, mill, was made by the Carnegie Steel Co. on several hundred tons of billets for various navy yards.

Youngstown Market Quiet

Youngstown, O., May 2.—The market for semi-finished steel is unchanged. Makers have little or no tonnage for sale. Proof of the sold-up condition of the mills was afforded this week when one maker purchased a lot of sheet bars to supplement its own steelmaking capacity. Shipments of sheet bars to consuming mills are going forward in good volume. No contracts for shipment in the last quarter have been taken. The first of the two new open hearth furnaces of the Brier Hill Steel Co. started operations today, when the first heat was drawn. The second furnace will come in within 10 days.

Still High

Pittsburgh, May 2.—Generally, the market for semi-finished products is quiet. Billets and sheet bars continue to be quoted at a range from $45 to $50, mill. Wire rods are being held at a range from $60 to $65 and muck bar has sold at as high as $45 a ton, or $5 a ton above the previously prevailing price.

Bolt Prices

Are Being Adhered to—Longest Contracts are to Dec. 31

Cleveland, May 2.—Cleveland manufacturers of nuts and bolts are strictly adhering to the last advance in prices and are contracting with the jobbers to July 1, 1916, only. Contracts are being made with implement manufacturers, railroads and other large consumers at present prices up to Dec. 31, 1916. The demand is active.

Some Quote Higher

Pittsburgh, May 2.—No formal change in prices of nuts, bolts and rivets has been made this week, but several manufacturers are quoting products at slightly above prices adopted last week. Demand for rivets for shipment to car builders and ship builders is decidedly heavy and ship rivets are commanding premium prices in many instances.

Bolt Demand Strong

Chicago, May 2.—Insistent demand for bolts and nuts continues and consumers of all varieties are attempting to cover their requirements. One important mill has sold its entire output for 1916 and most others have booked sufficient business to last for three or four months.

Agricultural implement makers are beginning to sound the market and arrangements will be made to care for their necessities as far as possible. The sentiment obtaining, however, is that contracts will be made only for six months instead of for 12 months, as has been the custom.

One problem makers of bolts and nuts are facing is where they will obtain steel from which to make their product during last quarter. They have obtained material for third quarter and are safe that far, but the final period is still in doubt.

On May 1 the New York sales offices of the Midvale Steel Co. and of the Worth Bros. Co. were consolidated with those of the Cambria Steel Co., which have been at 165 Broadway, and the combined offices will be in charge of L. B. Morris, as general manager of sales in the New York district. The offices of the Midvale Steel Co. formerly were located at 50 Church street and those of the Worth Bros. Co. at 165 Broadway.

(*For complete prices see page* 1020.)

Ferro Users

Are Not Rushing to Buy at Prevailing High Spot Prices

New York, May 2.—Buyers of ferro-manganese who have been inquiring for early metal are less inclined to pay the extraordinary prices which recently have ruled for spot delivery. One consumer who now is in the market for two carloads for spot or nearby has been quoted $400, delivered, but has been unwilling to offer over $250, delivered. The business still is pending. Increased domestic production of ferro-manganese which, as previously noted, has been a factor tending toward taking the edge off of the market for early delivery, is continuing to exert this influence. Middlemen who have been holding odd lots of spot metal now are inclined to lower their price. Where $425, seaboard, was quoted on carload lots a week or two ago, $400, seaboard, now is being named. Just what could be done actually on spot is uncertain, as there are practically no sales. Domestic ferro-manganese for shipment after July continues to be offered at $225, furnace. The Sheridan, Pa., furnace recently purchased by E. J. Lavino & Co., which is to be operated on ferro-manganese with Brazilian ore, is expected to be blown in the latter part of the current week.

English makers now are willing to accept contracts for ferro-manganese for all 1917 delivery at $175, seaboard. Prior to this time, they have been holding this price to first half of next year. There is not much buying for next year at present and the week's sales totaled but a few hundred tons. A buyer in the Chicago district remains in the market for 1,000 to 2,000 tons for first half of next year. English ferro-manganese for last quarter of this year still is available at $200, seaboard. Spiegeleisen is unchanged at $60 to $65, furnace, for last half, with higher for early delivery. Buying is light.

High Ore Prices

Philadelphia, May 2.—The unprecedented prices for manganese ore still are continuing to work to considerably higher levels. Recent sales of schooner-loads of Brazilian ore, amounting to 1,000 to 2,000 tons each, have been made at 72 cents per unit at eastern seaboard. It is stated that prices now are higher. Reports are current in the market that Indian ore could not be bought today at much under 90 cents per unit at eastern seaboard.

Order Shapes for Stock

But Are Not Willing to Contract at $60 Per Ton, Pittsburgh, Quoted by Eastern Mills

Philadelphia, May 1.—Large fabricating interests and other users of shapes in tonnage quantity have been liberally specifying against their contracts at 2.50c, Pittsburgh, with eastern mills and evidently are ordering in some of this material for stock. They are unwilling, however, to close for contract tonnages or place any material in stock at the present price of 3.00c, Pittsburgh, which eastern mills are quoting on new commitments. These buyers regard the speculative element in such a price as too great for them to assume the risk of carrying the steel and they are only placing orders at this figure where their own customers will agree to that plain material basis. Eastern shape makers are making some small contracts for specification by Sept. 30 at 3.00c, and they have been asked to quote for specification by the end of the year, but have not yet done so. Some eastern mills will sell at 2.70c, Pittsburg, on specific orders. Mill specifications are heavy and the tonnage of active orders remains on the increase. Miscellaneous new business has been less active the past week. The Carnegie Steel Co. quoted 2.60c, Pittsburgh, on a quantity of shapes for navy yard stocks.

Toledo's New Hotel

Cleveland, May 2.—Bids were received last week on the hotel to be erected on the site of the Boody House, Toledo, requiring 5,600 tons of steel. The new structure is to be known as the Bond hotel. The general contract has not, however, been awarded, but it is expected that it will go to the Toledo Bridge & Crane Co. The 1,500 tons of reinforcing bars required for the new Hotel Winton, Cleveland, have not been placed. The Franklin Steel Co. is quoting 2.95c for rerolled bars. It is understood that this price is being shaded by Chicago mills.

Structural Tonnages Small

Chicago, May 2.—Contracts for structural shapes continue in fair number, but mostly for small tonnages. High prices and remote delivery have discouraged investment building involving steel and it is being used mostly in structures where the proportion of steel to other materials is small and the added cost is not proportionately large. Projects recently let follow the rule, especially during the past few weeks, and industrial railroads and public structures are almost the only ones now being figured. The largest item taken in the west during the past few days involves about 700 tons for a tilting furnace for the Illinois Steel Co. at South Chicago, which will be fabricated by the American Bridge Co.

The nominal quotation on structural shapes is 2.69c, Chicago mill. This applies on definite projects for next year's delivery or at convenience of the mill and premiums are being paid to those producers who can supply prompt material.

Unexpected Activity

New York, May 2.—New work in fabricated steel is coming out freely and the market is displaying an unexpected vigor in view of the present high prices of steel. The railroads are putting out bridge work in good volume while there is a heavy tonnage for extensions of industrial plants of all sorts, including some iron and steel propositions. In strictly metropolitan work, many loft and apartment jobs are being figured actively. The 15,000-ton Pennsylvania railroad hotel projected now is officially announced as closed. Subway and elevated work again is looming up, one award of 28,000 tons having been released while 11,000 tons of new contracts are offered. On the large order just closed, the city saved a heavy sum by reason of the fact that when the work was offered last November, the American Bridge Co. gave an option of $51.60 per ton, delivered, and this now is taken up. Today prices are not less than $80 to $85, delivered. Fabricated prices still are moving up and small jobs are going at 5 to 5½ cents per pound, delivered, while $103, erected, recently was named on a larger contract. Labor shortages are keeping down fabricated shop output. The Pennsylvania and Reading roads have restored the embargo against New England, which ties up many shipments of finished work. Plain steel prices remain at 2.50c to 3c, Pittsburgh, or 2.669c to 3.169c, New York.

Shipments Heavy

Pittsburgh, May 2. — Structural shapes continue to be sold at 2.50c for delivery at the convenience of the mill. Specifications from fabricators have not fallen off and shipments last month were equally as heavy as those of March.

(*For complete prices see page* 1020.)

CONTRACTS AWARDED.

Additional work for new open hearth plant of Donner Steel Co., Buffalo, 1,000 tons, to Lackawanna Bridge Co.

Additions to the plant of the Traylor Engineering Co., Allentown, Pa., 600 tons, to the McClintic-Marshall Co.

Aluminum foundry for the Simplex Automobile Co., New Brunswick, N. J., 125 tons, to Martin R. Everett, Inc., Newark, N. J.

Pelham Bay park elevated railroad section, Bronx, New York City, 28,000 tons, general contract awarded to Lawrence C. Manuell and steel work will be furnished by the American Bridge Co.

Building for Girard estate for Snellenberg store, Philadelphia, 600 tons, to Levering & Gerrigues.

Boiler house for the Atlantic Refining Co., Philadelphia, 500 tons, to the McClintic-Marshall Co.

Hotel Pennsylvania on Seventh avenue between Thirty-second and Thirty-third streets, New York City, 15,000 tons, steel erection contract now officially announced as having gone to Post & McCord and American Bridge Co. will supply the steel.

High school, Portland, Me., 850 tons, to the McClintic-Marshall Co.

Office building for the Bush Terminal Co., Forty-second street, New York City, 1,900 tons, now officially announced as awarded to the American Bridge Co.

Bridges over the Mystic river, for the Boston Elevated railroad and the City of Boston, 1,750 tons, McClintic-Marshall Co. to receive awards.

Building for Logan Trust Co., Philadelphia, 300 tons, to American Bridge Co.

Theater and store, Olean, N. Y., 150 tons to George Kellogg Structural Steel Co., Buffalo.

Illinois Steel Co., one 200-ton tilting furnace, South Chicago, Ill., 334 tons of structural steel, 349 tons of machinery, to American Bridge Co.

Louisville Gas & Electric Co., extension to waterside power station, Louisville, Ky., 642 tons, to American Bridge Co.

Duluth & Iron Range Railroad, ore car repair shop, Two Harbors, Minn., 601 tons, to American Bridge Co.

Pacific Building Co. office building, San Francisco, Cal., 600 tons, to Dyer Brothers.

Chicago, Burlington & Quincy railroad, steel channels and center sills, 286 tons.

CONTRACTS PENDING.

Section No. 5 of route 8 of new subway from Metropolitan to Bushwick avenues, Brooklyn, 3,700 tons, bids to be received May 22.

Section No. 4 of route 8 for subway from North Seventh street to Manhattan avenue, Brooklyn, 4,300 tons, bids to be taken May 16.

Additional bridge work for the Pennsylvania railroad, 1,000 tons; bids being taken; about 1,800 tons now pending.

Bridge work for the Lehigh Valley railroad, 3,600 to 3,800 tons, bids being taken.

Transmission poles for the New York Connecting railroad, 2,000 tons, bids being taken.

Buildings for finishing mills of Donner Steel Co., Buffalo, 2,000 tons, bids being taken.

New open hearth plant of Brier Hill Steel Co., Youngstown, consisting of four furnaces, now understood will call for 5,000 tons instead of a smaller quantity previously stated.

Hammer shop for American Locomotive Co., Schenectady, N. Y., 400 tons, bids being taken. This increases inquiries for enlargements of this company now in the market to 1,000 tons.

Plate Prices Moved Up

Eastern Pennsylvania Maker Quotes $80, Pittsburgh, and Small Lots for Early Delivery Bring $110 Per Ton

Philadelphia, May 1.—One of the most important eastern Pennsylvania makers of plates, whose capacity is sold up far ahead, has advanced its official price schedule $5 a ton, to 4.00c, Pittsburgh, or 4.159c, Philadelphia, for shipment at the mills' convenience. This means on a new sale of tank plates, delivery in December or January and on universal plates in about three months. One or two other eastern Pennsylvania makers also report this price as their present schedule, while others still name 3.75c, Pittsburgh. Small lots of early plates continue to bring 5.50c, Pittsburgh. The demand upon the mills continues as heavy as ever. Marine construction constantly is presenting a heavy new tonnage, but because of the deferred deliveries by the yards, some prospective boat contracts are being held back. Complaint is to be heard among eastern plate makers of the reduced efficiency of labor despite recent wage advances. The Carnegie Steel Co. is to receive the 4,000 to 4,500 tons of plates, shapes and bars for government navy yards closed the past week. This company quoted 3.00c, Pittsburgh, to Pacific coast yards on the largest lot of plates included. Its prices ranged from that figure to 3.40c, Pittsburgh, on ordinary quality plates.

Gradually Strengthen

Pittsburgh, May 2. — Strikes and threatened labor trouble have tended to minimize activity in the Greater Pittsburgh district this week. Demand for steel plates continues heavy and considerable new buying is enjoyed, but there is not the excitement experienced a month or two months ago. Some of the larger mills are refusing to shade 2.90c for delivery at their convenience, but the 2.75c price has not entirely disappeared. One local mill is selling plates for delivery from two to six weeks hence at as high as 4.25c.

Plate Supply Negligible

Chicago, May 2.—Consumers of steel plates find no lessening of difficulty in obtaining prompt material. Especially is this true of wider material, which naturally is less available than narrower sizes which can be rolled by more producers. The quotation is 3.09c, Chicago mill, for delivery at convenience, but large premiums are being paid wherever prompt material can be found.

Cast Iron Pipe

Active Demand for Flange Work—Oil Companies Inquire

New York, May 2. — An active demand for flange work is current in the cast iron pipe market and makers are able to obtain good prices on this product. Oil companies have been inquiring heavily and machinery builders also have been active buyers. On standard pipe, the market is quiet. Public lettings are few and private buying has fallen off somewhat. Prices of pipe, however, are well maintained and show a tendency to work higher. The United States Cast Iron Pipe & Foundry Co. has taken 3,150 tons of 4 to 48's from the Carnegie Steel Co. for shipment to Bessemer, Pa. The Standard Cast Iron Pipe & Foundry Co. has been awarded 175 tons of 4 to 12's for Peekskill, N. Y. No decision on the 12,000 tons for Rochester, N. Y., yet has been reached and it still is uncertain whether iron or steel will be adopted.

Small Cities Buy Pipe

Chicago, May 2.—Rather more demand for cast iron pipe for waterworks extensions is being experienced now than for several weeks. Evidently smaller cities have made up their mind how much they can buy at present prices and are inquiring for their requirements. The United States Cast Iron Pipe & Foundry Co. has taken 400 tons for a contractor at Blue Island, Ill.

Coke Inactive

Southern Market Displays Strength—Quiet Elsewhere

Birmingham, Ala., May 2.—Southern coke is the strongest of all industrial products except steel. The foundries are absorbing the entire make with avidity. Makers continue to quote $4.50 f. o. b. ovens, for Yolande and Brookwood hand-picked 72-hour foundry makes, with furnace coke, which is in limited quantities, at $3 to $3.50. Throughout the south, especially in Texas where foundries are very busy indeed, the demand is a strong one. Some annual contracts will be renewed sooner than usual owing to consumers running out prior to expectations.

While not officially announced, it is known that the Sloss-Sheffield company will build 100 by-product ovens and a benzol plant near the North Birmingham furnaces, an investment of over $2,000,000. The plants will be reached by the company tracks, enabling minimum cost of haulage to the four furnaces at North Birmingham in the city proper.

(*For complete prices see page* 1020.)

Demand Falls Off

Cincinnati, May 2.—Contracting for foundry coke for yearly requirements has fallen off to a marked extent. This is because of the fact that the majority of foundries in this territory have closed for the last half of 1916 and the first half of 1917. No demand is out for furnace coke for either spot or contract delivery. Prices are a little weaker, but have not changed from those that have prevailed in the Wise county, Pocahontas and New River districts for the past month.

Coke Still Weak

Pittsburgh, May 2.—The market for Connellsville coke, dull and inactive for several months, shows no signs of improvement. Blast furnace fuel for spot delivery is being offered at as low as $2, ovens, but some sales are being made at $2.25, ovens. Demand is extremely light, some of the larger blast furnace plants having more fuel on hand than they desire. The market for future delivery is dull and prices have not been tested severely recently. The last sale of contract coke of importance was at $2.90, ovens. Seventy-two hour fuel for prompt delivery reflects weakness, although some dealers continue to obtain as high as $3.75, ovens, for standard grades. The *Connellsville Courier* for the week ending April 22, says production was 446,220 tons, a decrease of 16,700 tons compared with the week previous.

The Simplex Seamless Tube Corporation, Buffalo, according to an announcement made by the Buffalo chamber of commerce, has been incorporated and will acquire a site and erect a plant in that city for the manufacture of seamless steel tubing. The plant at the outset will have a capacity of 7,000,000 to 10,000,000 lineal feet of seamless tubing per year. The company will employ from 150 to 200 men and the first mill will contain from eight to 12 benches.

Representatives of the company state that contracts have been closed for tubing that will keep the plant busy on a 24-hour day basis for the next year.

Heavy Buying of Rails

Continued Up to the Last Minute Before the Advance Became Effective—Fair Car Orders

New York, May 2.—Rail orders reported to *The Iron Trade Review* during the month of April totaled 800,000 tons, and equals the record-breaking total of 800,000 tons during the month of March. Most of the rails ordered in the month just closed are for 1917 delivery. The prospective advance of $5 per ton in rails which brought about this tremendous activity, now is in effect, dating from May 1 and it is expected that there will be very few rail orders placed during the next several months.

The railroads continue to buy heavily up to the very eve of the day when the new price was instituted. The New Haven placed 20,000 tons with the Bethlehem Steel Co.; the Boston & Maine, 18,000 tons, of which 8,000 went to the Pennsylvania Steel Co. and the balance to eastern independents. The Maine Central also closed for 7,500 tons. The Pennsylvania Steel Co. has booked a number of miscellaneous orders, including 3,000 tons for the Jackson Terminal railway; 2,000 tons for the Western Maryland; 1,500 tons of tee and girder rails for the Public Service Corporation; 1,500 tons for the Philadelphia Rapid Transit Co.; 1,000 tons for the Norfolk & Western; 1,100 tons for E. W. Clark & Co.; 1,200 tons for the Canton railway; 1,000 tons for the Bay State railway and 550 tons for the Trenton & Mercer County Traction Co. New York municipal railways closed for 3,000 tons of girder rails with the Pennsylvania Steel Co. and the Lorain Steel Co.

Car orders in April totaled about 7,000, compared with 8,750 in March, 12,900 in February and 21,700 in January. The market has been somewhat more active the past week. New awards in that time include the following:

Anaconda Copper Mining Co., 200 hoppers to the Western Steel Car & Foundry Co.

Paris & Lyons Mediterranean lines, 500 gondolas additional to the Pressed Steel Car Co.

Louisville & Nashville, 450 underframes to the Bettendorf Axle Co., 200 underframes to the American Car & Foundry Co., 100 underframes to the Mount Vernon Car Mfg. Co.

New inquiries are as follows:

Illinois Central, 300 wooden stock cars.

Carnegie Steel Co., 80 coke, 30 gondolas, 3 flat.

Brier Hill Steel Co., 30 hoppers.

Seaboard Air line, 50 caboose, 15 express.

Rock Island, 300 center constructions.

Buffalo, Rochester & Pittsburgh, 20 caboose.

San Pedro, Los Angeles & Salt Lake, 100 to 300 automobile.

E. E. White Coal Co., 50 to 100 mine cars.

Societe Commerciale d'affretement et de Commission, 300 to 500 coal cars.

The American Locomotive Co. has taken orders for three locomotives for the Cuba Co., three for the Shantung railway and one for the Ashland Coal & Iron railway.

Considerable inquiry for standard spikes for next year continues but makers are not disposed to quote so far ahead. The Baltimore & Ohio wants 20,000 to 30,000 kegs, the Norfolk & Western 10,000 kegs and the United Railways Co., of Baltimore, 1,500 kegs for that period. The Chesapeake & Ohio asks 9,000 kegs for this year.

Rail Buying at End

Chicago, May 2.—No standard steel rails have been sold during the past week except in small tonnages of no importance to the mill. It is asserted that all important railroads are covered already for this year's requirements and most have placed their orders for 1917. While large volume of inquiry was received after announcement was made of the increase in price, much of this was simply an effort to get under the new price, and under existing circumstances it could be refused without difficulty.

Demand for track fastenings continues excellent and large tonnages of spikes, bolts and tie plates have been booked recently, much being for delivery in 1917. Spikes for that delivery have commanded 2.90c, Chicago, while some small tonnages of spikes for prompt delivery have been taken at 2.75c, Chicago. No change in quotations on these materials has been made.

Railroads Buy no Cars

Chicago, May 2.—New inquiry for freight cars is entirely lacking in the west. The most recent was from the Louisville & Nashville railroad for steel underframes and following this an order for 400 underframes was placed with the Mt. Vernon Car Co.

Cold Rolled Strip Steel

Pittsburgh, May 2.—The market for cold rolled strip steel is active and the tendency of prices is upward. The bulk of the tonnage for delivery the third quarter of this year has been sold at prices ranging from 6c to 6.25c, base. Manufacturers do not appear anxious to book additional tonnage for extended shipment, on account of the uncertainty of the market for raw material.

(For complete prices see page 1020.)

Wire Products

Are Marked Up From $2 to $4 Per Ton—Fourth Advance This Year

Pittsburgh, May 2.—The American Steel & Wire Co., under date of May 1, advanced nails, polished staples, galvanized staples and painted barb and galvanized barb wire $2 a ton; plain wire and galvanized wire, $4 a ton, and is now quoting these products as follows: Nails, $2.50 a keg; plain wire, $2.45; galvanized wire, $3.15; polished staples, $2.65; painted barb wire, $2.65; galvanized barb wire, $3.35; galvanized staples, $3.35 per 100 pounds. The Pittsburgh Steel Co. and several other makers are quoting nails at $2.60 a keg, or $2 a ton above the price of the American company.

The adoption of new prices further reduces the spread between the price of nails and the price of plain wire, which had been $3 a ton since Sept. 20, 1915, previous to which time a differential of $4 a ton had existed for many years. The differential between nails and plain wire now is only $1. Records kept by *The Iron Trade Review* indicate that during part of 1902, all of 1903 and part of 1904 the differential between nails and plain wire was $2 a ton; from June 1, 1900, to Oct. 1, 1902, the differential was $1 a ton, the same as it is today. During part of 1898 and 1899 a differential of $5 a ton existed between the price of nails and plain wire.

Four advances of $2 each have been made by the leading interest this year on the following dates: Jan. 22, Feb. 11, March 1 and May 1. Wire nails today are commanding $18 and plain wire $21 a ton above prices prevailing a year ago.

The Champion Spark Plug Co., Toledo, is at work on its new steel and concrete addition to its plant on Upton avenue, near Dorr street. The work is now well under way and it is expected will be ready for occupancy by the first of June. The improvements will cost in all close to $100,000. The building is to be six stories with dimensions 84 x 140 feet. The present capacity of the plant will be doubled when the new building is completed. New machinery has been ordered which will provide for a daily output of 100,000 spark plugs.

Daily Iron Output is 107,517 Tons

Average 24-Hour Production During April Surpasses Any Previous Month—
321 Furnaces in Blast on Last Day of Month

THE blast furnaces of the country cling tenaciously to their monthly record of setting new high marks in pig iron production. The complete figures just compiled for last month show that a new high average daily record was established in April, the gross production, however, declining because of the shorter month. The opinion has been freely expressed for some months that the blast furnaces could not maintain their remarkable record of the past year. Some stacks, in fact, have shown the effects of their campaign and have been blown out for relining, but the producing capacity of those in blast, coupled with that of the new furnaces blown in each month, has more than offset any capacity lost through furnaces blowing out.

MONTHLY PRODUCTION.

	1916.	1915.	1914.
January	3,171,878	1,591,024	1,879,336
February	3,078,548	1,666,592	1,888,607
March	3,327,630	2,046,280	2,341,551
April	3,225,496	2,114,518	2,261,501
May		2,255,157	2,097,019
June		2,369,932	1,904,566
Total 1st half		12,043,503	12,372,580
July		2,563,311	1,955,324
August		2,774,825	1,996,483
September		2,834,342	1,882,718
October		3,120,340	1,767,227
November		3,035,235	1,501,269
December		3,201,605	1,495,325
Total 2d half		17,529,658	10,598,346
Grand total	12,803,552	29,573,161	22,970,926

The actual output of coke and anthracite pig iron in April was 3,225,496 tons, compared with 3,327,630 tons in March, a loss of 102,134 tons. The average daily record, which more accurately portrays the month's activities, shows a gain of 174 tons in April, the figures for last month being 107,517 tons, against 107,343 tons in March.

The steel works or non-merchant furnaces were entirely responsible for this gain, as the average daily output of the merchant furnaces declined during the month. The production of non-merchant iron in April was 2,346,806 tons against 2,408,759 tons in March, a loss of 61,953 tons. The steel works furnaces averaged daily during April 78,227 tons, against 77,702 tons in March, a gain of 525 tons. The total production of merchant iron in April was 844,184 tons, compared with 887,454 tons in March, a loss of 43,270 tons. The merchant furnaces averaged daily during April, 28,139 tons against 28,628 tons in March, a loss of 489 tons.

The number of active stacks on April 30 was 321, the highest record set since Sept. 30, 1907. The net gain in active furnaces in April was six, of which four were merchant furnaces and two non-merchant furnaces. Six merchant stacks were blown in and two blown out. Four non-merchant furnaces were relighted and two blown out.

The production of ferro in April was 22,744 tons against 18,752 tons in March, a gain of 3,992 tons. The output of spiegel in April was 11,762 tons against 12,665 tons in March, a loss of 903 tons.

The merchant furnaces blown in last month were: One Iroquois, Miami Products Co.; one Detroit, Detroit Iron & Steel Co.; Oxford, Empire Steel & Iron Co., April 20; Dunbar No. 2, American Manganese Mfg. Co., April 13; Helen, Red River Furnace Co., April 7; and Alleghany, Alleghany Ore & Iron Co., April 21. Those blown out were: Crumwold, Reading Iron Co., April 18, and Dunbar No. 1, American Manganese Mfg. Co.

AVERAGE DAILY PRODUCTION.

	1916.	1915.	1914.	1913.	1912.
Jan.	102,319	51,323	60,624	89,929	66,220
Feb.	106,157	59,521	67,450	92,095	72,372
Mar.	107,343	66,009	75,534	89,123	77,791
Apr.	107,517	70,484	75,383	91,812	79,254
May		72,747	67,646	90,865	80,753
June		78,998	63,486	87,229	81,125
July		82,687	63,075	82,525	77,502
Aug.		89,510	64,403	81,839	80,650
Sept.		94,478	62,757	83,137	81,482
Oct.		100,656	57,007	81,933	86,569
Nov.		101,174	50,042	74,322	87,985
Dec.		103,278	48,236	63,746	89,590
Av'r'ge	105,814	81,022	62,934	83,980	80,124

The non-merchant furnaces blown in were: Ensley No. 4, Tennessee Coal, Iron & Railroad Co., April 4; Lorain No. 3, National Tube Co., April 23; one Lebanon, Pennsylvania Steel Co., April 8; and Belmont, Wheeling Steel & Iron Co. Those blown out were: Gary No. 12, Indiana Steel Co., April 18, and one Schoenberger, American Steel & Wire Co.

Wayne furnace of the Detroit Furnace Co., which has been under repair for several months, will be blown in this month. The Low Moor Iron Co. will blow in its third furnace within a few days to take the place of one of its furnaces, which will be blown out for repairs.

APRIL PIG IRON

States.	No. of stacks.	No. in blast last day of month. Apr.	Mar.	Total tonnage made. Merchant.	Non-Merchant.	—Totals— Apr.	Mar.
Pennsylvania	155	129	130	244,108	1,115,801	1,359,909	1,404,301
Ohio	74	65	64	185,248	509,062	694,310	722,817
Alabama	45	28	27	151,729	75,649	227,378	235,485
Virginia	22	10	9	33,007	.....	33,007	35,226
New York	26	20	20	77,341	113,401	190,742	205,472
New Jersey	6	1	0	1,538	.....	1,538	.....
Illinois	26	24	23	49,337	272,231	321,568	344,968
Colorado	6	4	4				
Indiana	10	9	10	36,762	208,562	245,324	240,493
Maryland	4	4	4				
Wisconsin	6	5	5				
Kentucky	7	4	4				
West Virginia	4	4	3	40,350	26,831	67,181	64,699
Tennessee	18	9	8				
Washington	1	0	0				
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	3	3	3	24,764	25,269	50,033	42,752
Michigan	3	2	1				
Missouri	1	0	0				
Spiegel—All states...						11,762	12,665
Ferro—All states....						22,744	18,752
Totals	422	321	315	844,184	2,346,806	3,225,496	3,327,630

Oil Country Pipe

Has Been Advanced from $4 to $10 Per Ton—Active Demand

Pittsburgh, May 2.—The National Tube Co. under date of May 1 sent out revised cards on oil country goods, providing advances in price similar to those announced under date of April 21, when standard pipe was advanced from $4 to $10 a ton. Manufacturers of wrought iron oil country goods also have put up prices about $2 to $4 a ton. Independent manufacturers of tubular goods continue to quote products at wide ranges in price, most of them having adopted lists showing prices slightly above those of the National company.

Sheets Bringing High Price

Deliveries Falling Behind—Heavy Gages Command Premiums—Chicago Market Steady

Youngstown, O., May 2.—Sheet prices continue at the same stationary level which has prevailed for some weeks. This slowness in responding to factors conducive to higher prices is the outstanding feature of today's market. A satisfactory answer has not yet been found to explain the sudden halt in the advancing prices for sheets. The controlling factors of the market apparently favor a price advance, but in reality, some business has been moving at prices slightly below the generally accepted quotations. Inquiries continue heavy, although in less volume than prevailed several weeks ago. Mills are easily offered more tonnage than they can handle. There is a general expectation that the prices of sheet bars for last quarter delivery will be higher. Despite these conditions, black sheets in isolated cases have attracted prices below 2.90c, blue annealed in lighter gages has gone for 3.00c while the minimum of 4.85c on galvanized sheet has been shaded.

Some sheet makers express the opinion that the steady advances during recent months have caused some consumers to withhold their orders in the belief that prices would recede. These makers expect a considerable new buying movement within six or eight weeks, provided prices show no signs of weakness during the intervening period.

The only evidence of stronger sentiment during the past few days has been a tendency to establish No. 10 blue annealed more firmly on a 3.25c base. Most makers had been holding for that figure and that price is now asked more generally. Lighter gages of blue annealed continue to bring out quotations of from 3.00c to 3.10c.

More mills during the week also adopted the 3.00c base on black sheets but the minimum quotation of 2.90c has not disappeared. Prices for galvanized remain unchanged, light gages having gone as high as 5.25c while on heavy gages, the minimum of 4.85c and even lower has been quoted and accepted.

Operations in this district continue heavy. Sheet bar shipments are generally satisfactory and with the exception of the galvanizing departments, most mills are running full.

Receive Top Sheet Price

Philadelphia, May 1.—In some cases, eastern Pennsylvania sheet makers continue to obtain as high as 4.00c, Pittsburgh, or 4.159c, Philadelphia, for No. 10 gage blue annealed, but they are not in a position to make many sales. A lot of 1,000 tons for third quarter is reported to have been closed the past week. The spread of prices remains from 3.75c to 4.00c, Pittsburgh.

Sheet Demand Heavier

Pittsburgh, May 2.—Demand for steel sheet products gradually is becoming heavier, and shipments are more deferred than ever. Some irregularity is reflected by galvanized products, but black and blue annealed sheets are decidedly strong. Small tonnages of blue annealed products have commanded above 3.25c for No. 10 gage and some mills are obtaining more than 3c for open hearth black steel sheets.

Hold Steady

Chicago, May 2.—Conditions in the sheet steel market are unchanged and continue irregular. Narrower sizes and lighter gages are more easily obtained than others. No. 10 blue annealed continues to be quoted higher than No. 28 gage black, the former being obtainable at 3.19c to 3.29c, Chicago mill, while the latter may be obtained at 3.09c to 3.19c, Chicago mill.

Demand for sheets is not insistent. Mills are able to keep up without difficulty even in the face of a shortage of sheet bars.

High Prices for Heavier

Cleveland, May 2.—The demand for heavy sheets is very strong and 3.70c is obtained without difficulty on No. 10 black. A sale of stretcher leveled blue annealed, including extras, was made at 4.45c. On the lighter gages, prices are relatively not as high as on the heavier, owing to the usual differential being disregarded.

Will Construct Heat Treating Furnaces

The Quigley Furnace Specialties Co., 26 Cortland street, New York City, has been organized for the purpose of engaging in the design and construction of all kinds of heating and annealing furnaces. The furnace specialties department will manufacture and deal in a line of furnace materials, equipment and appliances for the improvement of furnace construction, operation and methods, including high temperature furnace cements, insulating brick, automatic fuel oil valves, oil, gas and powdered coal burners and appliances, temperature and draft controling and recording systems, gas analyzing instruments, etc. The engineering and contracting department of this company will analyze and make comparative statements of operating costs of powdered coal, hand or stoker-fired coal, gas and fuel oil and will make recommendations as to the most economical fuel and its applications. Complete plans, specifications, estimates and supervision for the entire installation and application of any fuel, including furnace alterations or new construction, will be furnished. W. S. Quigley, who has had a wide experience in the design and construction of heat-treating furnaces, is president; H. A. Kimber is vice president, and J. H. McFadden, secretary.

Warehouse Prices

Have Been Advanced $3 to $5 in the New York District

New York, May 2.—An advance of $3 a ton on shapes and bars and $5 a ton on plates has been put into effect by warehouses in the metropolitan district. The new schedule is 3.25c, delivered in New York territory for shapes and bars and 4.25c for plates.

Higher at Buffalo

Buffalo, May 2.—With the mills and agencies of the Buffalo district sold up solid on practically all lines over the remainder of the year, and 1917 deliveries being quoted on all new inquiries coming in, the warehouse prices in this district have been advanced again. Bars and shapes have gone up to 3.35c, rounds and squares 2 inches and over have been advanced to 4.20c, and plates are being quoted at 4.15c. In addition to these prices, an extra charge of 5 cents is being asked for store door deliveries.

The mills and agencies of the Buffalo district report that more tonnage was declined during the month of April than was placed on the books of the various offices.

Warehouse Sales Good

Cincinnati, May 2.—Warehouse business is as good as at any time this year. Demand is heavy for building materials, but warehouses are finding it a difficult matter to secure deliveries from mills. Prices are unchanged, but strong. Cold-rolled bars are given at list plus 20 per cent, hot-rolled bars from 3.20c to 3.75c, and shapes and plates from 3.20c to 3.50c. No 10 blue annealed sheets are quoted at 3.50c, and black No. 28 sheets at 3.95c.

(*For complete prices see page* 1020.)

Scrap Registers Decline

Embargoes Responsible to Certain Degree—
Sales Light at Buffalo

Philadelphia, May 1.—Traffic conditions again are playing a very important part in the old material market in eastern Pennsylvania. Embargoes have been restored at Coatesville and Parksburg and the Philadelphia & Reading has placed a ban on scrap shipments to New England. The Pennsylvania, however, still will accept shipments to that territory. Buyers are cautious not to make purchases of material for early delivery which are not of the class admitting of a minimum of handling, as the supply of labor is inadequate. The labor factor appears to be assuming increasing importance as a market influence. New buying of scrap has remained quiet, but the undercurrent is healthy because practically all consumers are using metal to the maximum of their facilities. Further small lots of heavy melting steel were sold the past week at $17.50, delivered eastern Pennsylvania, and large buyers will not offer more than that figure.

Softening at Buffalo

Buffalo, May 2.—Inquiries are coming into the market for large tonnages of scrap materials, particularly heavy melting steel, turnings and borings. The sales of the past week, however, have been light. Dealers anticipate a return of the activity noted a few weeks ago. Machine shop turnings have softened to $8 to $8.50, due largely to the embargo placed by the leading consumer. This is expected to be lifted in a short time. A light demand for old car wheels has caused that commodity to soften to $15 to $15.50. Other prices in the list remain as previously quoted.

Decline at Pittsburgh

Pittsburgh, May 2.—Congested traffic conditions in mill yards of at least seven prominent manufacturing interests in the Greater Pittsburgh district have made it impossible for scrap dealers to ship much tonnage. Railroad embargoes exist at Brackenridge, Johnstown and at Canton, O., and shipments virtually have been cut off at Munhall and Monessen. Heavy melting steel, being held at $18.25 by most dealers, has been sold at as low as $17.25 this week. Machine shop turnings and borings, demand for which is heavy, have been offered at a range from $10.50 to $11, or 50 cents a ton below prevailing prices of a week ago. None of the more important melters of scrap in the Greater Pittsburgh district appears to be interested in quotations, and some dealers have been forced to dispose of material at a loss in order to move tonnages on track. The extensive manufacture of steel for munitions, and the resultant increase in production of crop ends have contributed to depress the scrap market for heavy melting material.

Quiet in Chicago

Chicago, May 2.—Although the Chicago iron and steel scrap market is fundamentally strong, present conditions have brought about somewhat lower quotations. The change from recent high levels is not marked, but practically all items are moving at a slightly lower level. Consumers are not taking much tonnage and most scrap is moving only between dealers in covering short sales during the recent buying. As short sales are covered, demand is lessening and this has the effect of weakening quotations.

Railroad offerings continue to be be fair and spring track work is releasing the usual quantity of steel rails, which is reflected in a lower quotation on rerollers. Current lists are as follows: Chicago, Rock Island & Pacific railroad, 3,500 tons, including 700 tons of No. 1 wrought and 400 tons of No. 2 wrought; Chicago Great Western railroad, 300 tons of scrap rail; the Belt Railway of Chicago, 1,330 tons; Chicago, Milwaukee & St. Paul railroad, 3,500 tons, including 1,000 tons of car wheels; Santa Fe railroad, 5,300 tons, including 1,000 tons of steel rails; Chicago & North-Western railroad, 3,900 tons, including 1,000 tons of steel rails.

Weak at Cincinnati

Cincinnati, May 2.—The scrap market is giving little encouragement to dealers. Buying is extremely low, and is centered mostly upon small lots for immediate delivery. Prices show no inclination to regain the ground lost last week, when a general decline of about 50 cents a ton occurred. Heavy melting steel is now quoted from $13.75 to $14.25 per gross ton. One dealer made a large sale today of stove plate at $8.50 per net ton. No. 1 machine cast is given from $11.50 to $12 per net ton, with but little demand from jobbing foundries for this grade.

(*For complete prices see page* 1020.)

Very Few Buyers

New York, May 2.—The scrap market continues in a period of softness and uncertainty because there are very few buyers, due to the freight embargoes and to congestion at consuming points. It is difficult to make sales and although the supply being offered is limited, the absorbing power of the market is less and some grades have suffered in price. The situation appears to be a purely temporary one as consumtion continues heavy. Heavy cast is off 50 cents and borings are lower, the best offers for the latter being $10.50, delivered.

Still Softening

St. Louis, May 2.—The scrap market continues to soften here with a tendency toward lower quotation levels. Railroad offerings of scrap have not been absorbed readily by consumers recently, and as a result dealers have been compelled to sell their material at declining prices. Lower mill grades appear to be holding up better than heavy melting steel, this likely being due to the fact that rolling mill consumers have been permitting their stocks of raw material to decline and therefore they can absorb more readily the mill grade tonnages being offered. The only railroad offerings before the market this week are: The Vandalia railroad, 600 tons; and the Nashville, Chattanooga & St. Louis railroad, 200 tons.

Not So Active

Birmingham, Ala., May 2.—The scrap market is not so active as it has been, but it is taking good care of itself at quotations unchanged except as to wrought and steel scrap. Wrought has advanced about $1 to $15 and steel is up 50 cents.

Merger Completed

The merger of the Penn Steel Castings & Machine Co., Chester, Pa., and the Baldt Steel Co., of New Castle, Del., has been perfected. These companies have been in the steel casting manufacturing business for 20 and 10 years respectively, and the new concern will be known as the Penn Marine & Ordnance Castings Co., Inc. It will have executive, general and sales offices at 132 South Fifteenth street, Philadelphia. The officers are: Rodney Thayer, president; Walter S. Bickley, vice president; C. Ferris Jemison, secretary, and Ivers S. Adams, treasurer.

Labor Troubles

(*Continued from page 962.*)

a strike of the dock hands at a number of wharves.

Quiet Restored

Pittsburgh, May 3. (By wire.)—Comparative quiet was restored in the Turtle creek strike zone this morning by the arrival of two companies of militia and by the arrest last night of six men and a girl, alleged to have led mobs of strikers in attacks on steel works yesterday. The Edgar Thomson works of the Carnegie Steel Co. are operating almost in full and it is believed that normal conditions will prevail by tonight at other plants closed on account of the strike.

Strikes have been declared in several additional plants in the Pittsburgh district. Some trouble occurred at the West Penn Steel Co.'s plant, Brackenridge, yesterday when employes demanded wages higher than those offered by the company. The Pressed Steel Car Co., the Duff Mfg. Co., the Enterprise Stamping Co., the McKinney Mfg. Co. and the car repair shops of the Pittsburgh & Lake Erie railroad have been affected by strikes. Ranks of striking machinists have been increased slightly, but in general the labor situation is much better today than it was yesterday.

Many Wage Advances

Chicago, May 2.—An advance of about 10 per cent in wages has been made for common laborers in almost all iron and steel plants in the Chicago district. This brings common labor to about 25 cents per hour. Concerns not already paying the advanced wage are preparing to do so in order to hold their workers.

The Inland Steel Co. advanced wages May 10 when a similar increase went into effect at the mills of the United States Steel Corporation. Bar iron and rerolling mills have taken the same action generally.

Large Expenditures

Chicago, May 2.—A strike by employes of the twine department of the International Harvester Co. at plants in Chicago, has spread until it involves workers in the foundries, machine shops, and other metal departments. Officials of the company state that about 5,000 employes are out and of these 1,500 to 2,000 are from the metal shops and foundries.

The company has offered a schedule of 10 hours pay for 9 hours work to settle the difficulty. This is an increase of about 11 per cent and applies to piece work as well as the hourly wage. This makes the minimum wage for a common laborer 24½ cents per hour.

Merely Wanted to Quit Work

Chicago, May 2.—Following a strike by employes of the Deering works of the International Harvester Co., molders employed by the Illinois Malleable Co., whose plant is located adjacent, walked out. No grievance was voiced and no demand was made on the malleable company and the men left their work through sympathy or fear.

Metal Markets

Weaker Tone Prevails except in the Case of Copper

New York, May 2.—With the exception of copper, the metals generally have reflected a weaker tone than in some time past. The red metal continues exceedingly strong, by reason of the most remarkable demand which the producers ever have experienced. Further good-sized export tonnages have been booked, and an immense business has been entered from domestic consumers, principally the brass mills, which are booking large new contracts for brass for military purposes. Electrolytic copper now is scarce up to July; this month is quoted at around 29.25c, delivered 30 days, while beyond July is quoted at 28.25c to 29.25c. Prompt electrolytic is quoted at around 30 to 31c. Ordinary lake copper is quoted at 30c to 31c, cash, for prompt shipment, while June and July ordinary and arsenical lake is quoted at about 29.50c, cash. Ordinary casting copper is held at 27.75c to 28.25c, cash.

Spelter continued to show a reactionary tone last week, but prices were stronger by reason of a better inquiry Friday and Saturday. The market since has been quiet and the level rather uncertain. Prime western is quoted as follows: Prompt 17.25c to 17.50c, St. Louis; May, 17c to 17.12½c; June, 16.25c to 16.50c; third quarter, 15c to 15.12½c; second half, 14c. Ordinary brass special spelter is quoted at 20c to 20.25c, St. Louis, for prompt shipment.

Lead is lower in the outside market, and second hands have been offering at around 7.25c to 7.37½c, St. Louis, and 7.37½c to 7.50c, New York. Demand is dull. The American Smelting & Refining Co. continues to quote 7.50c, New York, and 7.42½c, St. Louis.

The tin market reflects a tendency toward higher prices by reason of the continued difficulty in securing licenses for exporting the metal from England. Most importers at present are not sellers of spot. The market is quoted at 51.50c for spot, while ex steamer prices are: May, 50c; June, 48.50c; July, 47c. Demand is limited.

The aluminum market continues quiet. Prompt No. 1 ingots are quoted in the outside market at 59 to 61c. The Aluminum Co. of America has fixed its 1917 contract price at 35c, smelter.

Restrains

Consolidation of Pennsylvania and Bethlehem Steel Companies

New York, May 3. (By wire.)—A temporary injunction restraining the sale of the Pennsylvania Steel Co. to the Bethlehem Steel Co. was granted in the federal court at Trenton on the application of J. H. Brandt, of Philadelphia, a preferred stockholder, who charges that the sale is not proposed in good faith, and that the officers of the Pennsylvania Steel Co. will profit personally more than $1,000,000 if the transfer is made. He says the net income of the company the first four months figures at $700,000 monthly, and that among the assets is a $7,000,000 profit account on which no dividends have been paid. He charges that the stockholders are to meet May 4 at Camden to ratify the sale in an effort to evade the Clayton anti-trust act by subterfuge.

Ore Movement

For Last Month is Heavy in Spite of Many Difficulties

Cleveland, May 2.—Although the movement of vessels on the lakes during the past week has been attended by much difficulty owing to the heavy ice still being in the way, the movement for April was the greatest in the history of the lakes with the exception of April, 1910, when 1,520,305 tons were shipped. The movement for this April was 1,425,095 tons. The shipments last April amounted to only 503,832 tons. The movement for April this year compared with April of last year by ports was as follows:

Port.	April, 1916.	April, 1915.
*Escanaba	164,898	49,307
Marquette	53,258	4,438
Ashland	147,852	43,949
Superior	211,340	87,175
Duluth	538,281	174,989
Two Harbors	309,466	143,974
Total	1,425,095	503,832
1916 increase	.....	921,263

*One dock estimated.

The first receipts of iron ore at the Gary plant of the Illinois Steel Co. arrived April 29.

Warrants Easier

New York, May 3. (By wire.)—Iron warrants easier and are quoted lower at $14 to $14.50 for No. 2 at store in the Birmingham district. There is some inquiry both to sell and buy, but few trades.

Rennerfelt Electric Arc Furnace

THE USE of electric furnaces in the iron and steel industry has been expanding steadily in the past few years. Refinements in the design of these melting mediums have given them an assured position in steel plants. The author presents a discussion of the principle and advantages of the Rennerfelt type

BY C. H. VOM BAUR

THE Stassano furnace was the forerunner of the Rennerfelt. The former started with a radiating arc, playing almost horizontally over the bath, whereas the latter furnace forces the naturally large arc flame violently down on the charge and away from the roof by employing a different method of electrode arrangement. Polyphase current of any frequency and voltage is used.

The Rennerfelt furnace is shown diagrammatically in Fig. 1. The almost universally used 3-phase current is shown entering the transformers and is changed by a Scott connection to a 2-phase 3-wire system. The middle or combined conductor carries about 40 per cent more current in the vertical than in either of the side electrodes, and this forces the entire large radiating arc, by the resolution of forces and electro-magnetic action, down on the bath. This form of arc has hitherto been unknown in electric furnaces. The horizontal electrodes are about 15 inches (38 cm.) above the bath or slag, in some of the larger furnaces, and the operating distance from tip to tip of the horizontal electrodes is usually from 18 to 22 inches (45 to 55 cm.), or more. These dimensions give an idea of the size of the flame, which, striking the bath, mushrooms to the sides and ends of the furnace. The heat reaching the roof is consequently very indirect, thus favoring low roof-maintenance costs. These low roof-refractory costs have often proved themselves in practice; for instance, when melting cold steel scrap and making tool steel quality, heats taking five to six hours in a low-power furnace, at about 150 kilowatts per ton capacity of the furnace, the roof has lasted 192 heats with a 9-inch brick. With faster melting and the 12-inch brick, more heats could be expected per roof.

Large Furnaces Possible

The furnace is built in different sizes. The first 30 furnaces were three tons and under in capacity. Since then, a 4-ton furnace has been placed in operation and a second is expected to follow shortly. Eight-ton furnaces are building, while 12-ton and larger furnaces are being contemplated. Rennerfelt believes that with the multiple arc system, as proposed in principle years ago by Stassano, electric furnaces of 40, 50 and even 75 tons capacity can be made, and run to give satisfaction. This type of multiple arc furnace is shown in Figs. 2 and 3. A 40-ton furnace, for instance, would have four sets of electrodes of three each, the side electrodes being 6 inches (15 cm.)

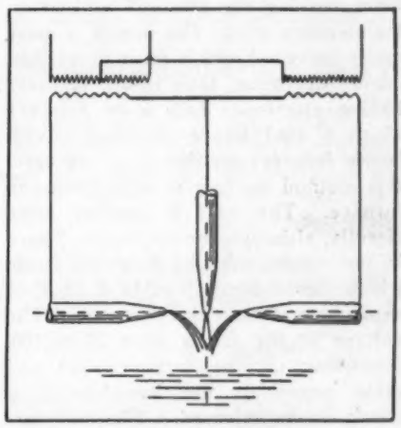


FIG. 1—ELECTRODES AND CONNECTIONS

and the top 7 inches (18 cm.) diameter, the furnace taking 4,800 kilowatts at the terminals. The inside diameter would be about 7½ feet (230 cm.) and the hearth proper about 14 feet (420 cm.) long.

On account of the peculiar characteristic of the Rennerfelt arc, it is very steady with hand regulation, and the furnace operation is electrically simplified to a marked degree, by avoiding all automatic electrode regulation, although motors with push-button control are contemplated. As only 4 to 6 pounds (1.8 to 2.7 kg.) of Acheson graphite are burned away per ton of cold steel scrap or pig melted and treated, it is evident that the electrode regulation with such a steady arc, made between three points of stability, that is, the tips of three electrodes, is a minimum, and this has been proved in practice. The electrodes oftentimes do not have to be adjusted for a half hour, and still the power consumption is about as steady during these periods as with an induction furnace. Light metal scrap or turnings can be heaped in the furnace with the electrodes touching the charge, and yet before many minutes the free-burning arc between the electrode tips has established itself.

All but three or four of these furnaces are operating with basic bottoms. Only a few operate with acid bottom, and these are in tool-steel works where the highest class of raw material is available at reasonable prices. The bottoms of these furnaces last as long as similar solid bottoms of open-hearth furnaces. The sides burn away a little faster and wear away also, due to the slag action, and the roof wears faster than the sides.

The wear of the electrodes seems to depend on three factors: First, the density of the current; second, the circular area and length exposed inside the furnace; and third, the amount of air leaking into the furnace. The latter cause seems to have the most deleterious effect and hence doors are fewer now than formerly. Up to the three-ton size there is only one door and that over the spout, all other furnaces having but two doors and these much tighter. The clearance of the cooling boxes is also made less. Only ⅛-inch (3 mm.) clearance is allowed, which is just enough room to compensate for the slight irregularity in the manufacture of what are ordinarily perfectly round electrodes.

The electrical conditions are most satisfactory, as evidenced by the opinions of central station managers. On account of the high power factor at 50 to 60 cycles, it being 90 to 97 per cent, the phase displacement is almost entirely avoided, and the phases are almost perfectly balanced.

Efficiency of the Furnace

The so-called efficiency of electric furnaces depends, as has been broadly discussed by Hering and others, on the rate at which the heat is forced into the furnace, and upon good insulation, proper painting, etc. The main point of these is the rate at which the power is consumed. Three or four years ago, 200 kilowatts were

Presented before the American Electro-Chemical Society, April 29.

considered ample for a one-ton furnace; now 350 to 375 for this size is common practice. Consequently the melting time has decreased and the kilowatt-hours per ton are less, the cost of the steel in the ladle is less, and the output is correspondingly increased. The practical limit to this high-powering of furnaces is the power of the refractories to withstand the higher heat for sustained periods. The refractories are also subjected to greater differences of temperature between heats, especially with those furnaces where the electric current cannot be maintained while there is no charge in the furnace.

With low-powered Rennerfelt furnaces the power consumption, when treating various metals, has been as follows:

	Kilowatt-hours. Metric ton.
Melting red brass	168
Melting pure copper	197
Melting white iron	290
Melting gray iron	325
Melting 80 per cent ferro-manganese	441
Melting steel scrap, not ready to pour	455
Melting and "killing" steel scrap on an acid bottom, about	600
Melting and refining steel scrap on a basic bottom, about	700
Melting 80 per cent ferro-manganese and holding, tapping and charging	741
Making 67 per cent ferro-tungsten, small scale	5,730

The characteristic features of the furnace may be summed up as follows: The heat is generated with an arc, exceedingly hard strains on the power supply being absent. On account of the steady power and on account of the large flame widely diffused, the heat is communicated to the charge quicker than with arcs of the thin-penciled type, made between the tips of the electrode and the bath. A large flame or a series of them sweeps over the major portion of the charge in the center of the furnace, or at regular distances along the major axis of the furnace, and is directed and violently deflected downwards. The heat being thrown downward in this way and being a radiating arc of large volume, the roof therefore has a long and satisfactory life. The furnace has only one small hole in the short-radius roof for each set of electrodes, both of these features making for strength and lower maintenance cost. The hearth is more easily surveyed and is more accessible, during operation, than in arc furnaces having electrodes only 2 or 3 inches (5 to 8 cm.) above the slag. With larger furnaces multiple arcs are used, this method starting in with the 6-ton furnace. The heat is applied more directly, although the arc is not. There is no water-cooling below the bath, which consequently avoids danger of explosions from this source. The voltage at the arc is from 75 to 100, depending on the furnace size, and these potentials are harmless if a shock is experienced. The amperes per electrode in large furnaces is small, namely, only 5,400 and 7,700 in a 3,600-kilowatt furnace. The hearth bottom is burned in by the arc without the use of coke or other material. The electric current can be kept on the furnace during tapping and charging, thus keeping the furnace at a uniform temperature, with its consequent advantage of keeping the refractories from checking. The furnace therefore does not cool down, and a saving of 10 to 20 minutes can be made on this account per heat, this being the usual charging time.

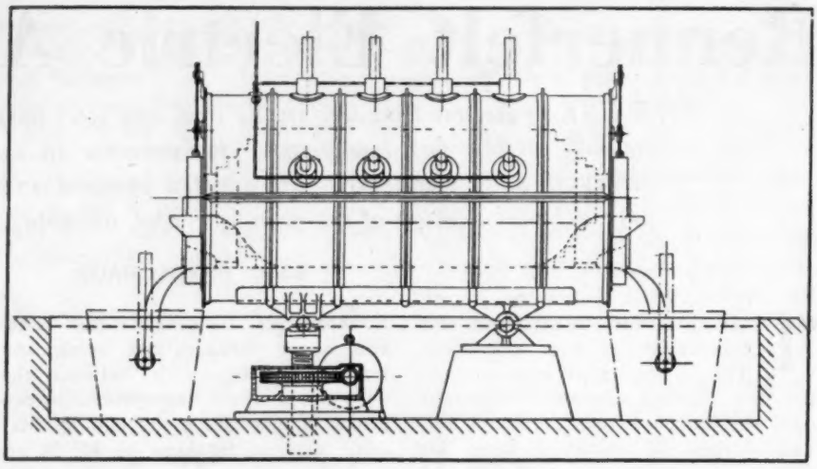


FIG. 3—FORTY-TON FURNACE

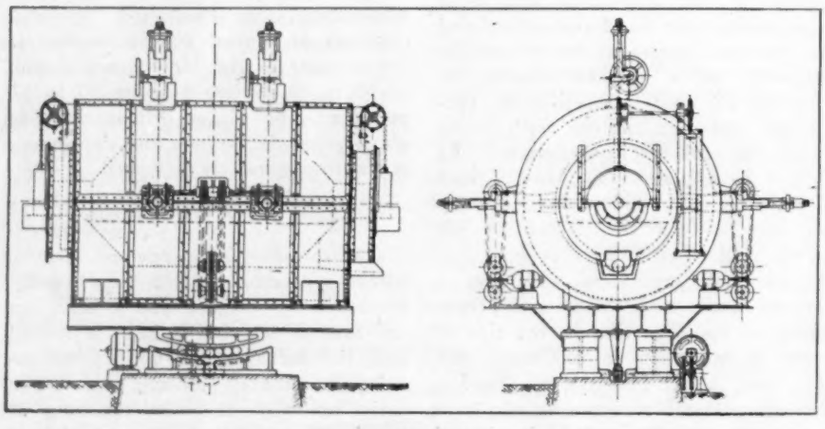


FIG. 2—TWELVE-TON FURNACE

Book Review

Coal and Coke, by Frederick H. Wagner; cloth; 431 pages; 6 x 9 inches; illustrated; published by the McGraw-Hill Book Co. and furnished by *The Iron Trade Review* for $4 net.

This book is divided into two parts, Part I, covering the first 100 pages being devoted to coal, and Part II to coke. After a brief introduction, the author discusses the origin and classification of coal, dealing particularly with peat, lignite, bituminous and anthracite coals from American mines. The coal section of the book also contains chapters on oxidation and spontaneous combustion, coking and gas coals, methods of analyzing coal and the preparation and storage of coal.

The coke section is divided into ten chapters. This portion of the volume contains a large amount of practical information on coking processes. A special chapter is devoted to ovens of the types used in the production of foundry and blast furnace coke, although in general the book seems to be written from the standpoint of the gas manufacturer, coke being considered as a by-product of gas rather than as a primary product. An appendix is presented containing a number of useful tables and a brief bibliography of the subject of coal and coke.

The Link-Belt Co., Chicago, is distributing an interesting pamphlet on "Moving Material Indian File". A complete description is given of the company's automatic conveyors. Views of actual installations are presented.

Modern By-Product Coke Practice

THE AUTHOR in this second and final installment discusses the benzol industry with particular reference to conditions after the war—The increased production of sulphate of ammonia and its relation to a government nitrogen plant—How the American and European standards of by-product practice compare

BY T. C. CLARKE

IN YEARS gone by, the amount of surplus gas available was guaranteed by the oven builders to be 5,000 cubic feet of gas per ton of coal, of a B. T. U. value of 500 per cent, coked. In Chicago the other day I visited a plant that had been in constant operation 27 months where the yield of surplus gas was 6,250 cubic feet and the B. T. U. value approximately 590. I am creditably informed there is one plant where the surplus gas runs to 6,600 cubic feet. This marked improvement of course, is only possible where the air is excluded absolutely as leaks would prevent any such results. This condition reflects the highest credit on the oven designers who have made such allowance for the expansion of the material employed in construction that they can get such results. The oven size has gone from a capacity of 4½ to 13½ tons of coal. At the present time, the latter seems to be about the standard, although some of the engineers are now advocating 12½-ton ovens. While it varies with different coals, an oven is generally about 17 to 22 inches wide, with a taper; this being necessary to facilitate pushing the coke. The height of the oven is about 10 feet and the length from 35 to 40 feet.

The doors which used to be a flat metal frame with a fire brick insert, causing what were known as "black ends", as the coal in the oven projected beyond the flues, are now made deep like a plug which goes into the oven far enough to hold the coal at the level of the first flue. The cost has increased from about $7,500 per oven to nearly $20,000 per oven. While seemingly excessive, this is easily explained by the increased weight of all the material entering into the construction of the ovens and their accessories.

Cost of Maintenance

The maintenance and conversion cost has been cut to well below 60 cents per ton of coal coked. As an example, a typical balance sheet for a 100-oven plant, each oven of 12½ tons capacity, on 18-hour coking time is shown in the table which indicates that the manufacturer has a ton of coke for less than the ton of coal cost, and also has 10,500,000 cubic feet of available surplus gas of 550 B. T. U. value, at 10 cents per 1,000 cubic foot. In addition he obtains a uniform coke both physically and chemically.

Balance Sheet of a 100-Oven By-Product Plant

Daily Expenditure.	
1,766 tons of coal at $3 per ton	$5,298.00
Conversion cost, including depreciation, contingencies and charges of every character except interest and administration, 60 cents per ton	1,059.60
Interest on investment of $2,000,000 at 5 per cent equals $100,000 or 22 cents per ton of coke, 1,236 x 22	271.92
	$6,629.52
Receipts.	
Tar 7 gallons per ton of coal at 2½ cents per gallon	$ 309.05
Sulphate, 1 per cent at $60 a ton	1,059.60
Gas 6,000 cubic feet at 10 cents per cubic foot	1,059.60
Benzol, 2¼ gallons per ton of coal at 14 cents (20 cents less 6 cents conversion)	556.29
Toluol 0.3 of a gallon per ton of coal at 15 cents per gallon	79.47
	$3,064.01

Making the cost of coke $6,629.52 — $3,064.01 = $3,565.51 which divided by 1,236 net tons of coke, being a 70 per cent yield, equals $2.88, per ton.

At present war prices, the fortunate owners of by-product coke ovens selling their benzol at 50 cents gallon and their toluol at $4.50 a gallon, find that their coke costs them nothing and they earn about $450 per day besides.

Reducing Coking Time

When changing from 24-hour coking time, the tendency was to reduce the time as low as possible, coke being made successfully under 16 hours. The high heats employed, however, made this practice most dangerous, for neglect at any time would melt the oven. Gradually the heats were brought back until a time was reached which the concensus of opinion deemed to be economically balanced. This time was 18 hours. Ovens after running for long periods on these heats show no signs of deterioration.

The least improvement has been shown in the methods of recovering tar and ammonia. In Germany and England the tar recovery is much better than in this country. Theoretically our coals should yield more than the seven gallons of tar shown in the balance sheet, and ammonia more than 1 per cent. As the coking time was brought down, the yield of tar and ammonia went with it, and frankly, as the coke ovens are being run principally to supply metallurgical coke, this subject has not been given the attention it deserves. The benzol industry, with the exception of the Semet-Solvay Co., is in its infancy. Plants have been built with practically every coke oven installation since the war began. What the result will be after the war, remains to be seen. Logically, its first and greatest market will be as motor fuel. The production now of gasoline from crude oil is:

Gasoline produced. Year.	Barrels.	Crude oil produced. Year.	Barrels.
1904	6,920,000	1904	117,100,000
1909	12,900,000	1909	183,200,000
1914	34,915,000	1914	265,800,000
1915	41,600,000	1915	267,400,000

Automobile licenses.

Year.	Number.
1905	85,000
1910	400,000
1914	1,253,000
1915	1,750,000
1916	2,225,000

It is interesting to note that while the production of crude oil from 1914 to 1915 advanced only 2,000,000 barrels, gasoline production in the same period advanced nearly 7,000,000 barrels.

Assuming the production of the old type of ovens at 5 tons of coal per day of 24 hours, and of the larger ovens at 15 tons, and getting a yield of 2½

Second of two installments. This paper was read before the Society of Chemical Industry, New York, April 21. The author, T. C. Clarke, is a consulting engineer and was formerly associated with the Lackawanna Steel Co. and the Lehigh Coke Co.

gallons of 50 per cent benzol per ton, we find the benzol production to be 84,990,000 gallons or 2,694,000 barrels per annum. Fear has been expressed that after the war the sudden dumping on our market of 85,000,000 gallons of motor fuel would break the price and that a number of lean years for the coke oven benzol producers would follow.

Without desiring to join the ranks of Ford advertisers, I should like to point out that if 200,000 of the 300,000 Ford cars produced annually remain in this country and have an average mileage of 5,000 miles per car, and assuming a gallon of gasoline for every 15 miles, the annul consumption will be about 66,000,000 gallons. Since the benzol output, if sold only for motor spirits, amount to 84,990,000 gallons and one make of car alone uses 66,000,000 gallons, it is fortunate that we have a new fuel coming on the market, to meet the increase in the production of automobiles.

The production of tar in gallons in 1905 was 36,379,000, and in 1910, 69,780,000. When the various plants now built and building are in operation, these figures will advance to 237,947,000 gallons of tar. Sulphate of ammonia production in 1905 in the United States was 65,000 tons of 2,000 pounds and in 1910, 115,000 tons. When the present ovens now built and building are operating, the production will be about 340,000 tons. The price of these commodities during the past 10 years has been 2½ cents per gallon for the tar, and around $60 a ton, for the sulphate of ammonia. The subject of ammonia cannot be dropped without referring to its connection with the proposed new nitrogen plant of the government. I fully appreciate the immediate necessity of being self contained in the matter of nitric acid, and of not relying on Chilean nitrates. When in Germany last summer, I was told that they were securing the nitrogen necessary for munitions by the direct electric arc process and by releasing the ammonia from the sulphate of ammonia and oxidizing it into nitric acid. This latter process, invented some years ago by a German chemist, was not commercially successful on account of the cheapness of Chilean nitrates. Since the outbreak of the war, however, it is one of the principal sources of supply.

Effect of War

The abnormal conditions existing during a war justify the use of these more expensive methods of securing nitrogen, for their increased cost is negligible. The Chamberlain bill, which I had supposed was for an increase in our army, seems to be broader in its scope, for it contains an amendment appropriating $15,000,000 for a hydro-electric plant, for the production of nitrogen. This product is intended for the army during war times and for fertilizer in peace times. If this is a war measure, should not the government establish a number of plants around the country for converting sulphate of ammonia into nitric acid, and should it not arrange with the many hydroelectric companies to take power from them during the duration of the war and secure nitrogen from the air? Should not the plants be broken up into small units, the geographical location of these plants being made with due regard to freight rates and the accessibility of material? I cannot seriously contemplate the government putting its entire reliance in one dam, which treachery or a bomb from an aeroplane could annihilate, thereby destroying the source of supply.

A Destructive Policy

We may well question then why the government contemplates the investment. The answer seems to be that it wants to go into the fertilizer business, in competition with private capital that has invested millions of dollars in the same industry, or else why should it spend $15,000,000 building dams to sell power to produce nitrogen for fertilizer purposes 99 per cent of the time in order to have nitrogen 1 per cent of the time. In war times the government can get all the nitrogen it wants from sources at present established. If private capital has never been able to make the direct recovery of nitrogen from the air by the electric arc process commercially profitable, can the government succeed?

It is natural to assume that the only process which has found a foothold on this continent, that is the cyanamid process, will be adopted. This is a process for the recovery of nitrogen from the air in the form of calcium cyanamid. The cost for power is much less than by the electric arc method. From calcium cyanamid, ammonia can be produced and like the ammonia released from sulphate, it can be oxidized into nitric acid. But why do this when sufficient nitrogen is already being recovered from coal?

The government doubtless, wants to enter into this enterprise, owing to a belief that there is a nitrogen shortage, predicating this assumption on the importations of sulphate of ammonia in the past. In 1914, the consumption of sulphate of ammonia or its equivalents, in the United States was 272,000 tons, of which 83,000 tons were imported. But as previously stated, the production in 1917, will be 340,000 tons. The increase in consumption in the United States in the last three years, from figures available, is as follows:

	Consumption, tons.	Increase, tons.
1911	230,000	.....
1912	246,000	16,000
1913	262,000	16,000
1914	272,000	10,000

Thus production is increasing in a greater ratio than consumption. Would it not seem reasonable then to suppose that the government would foster the sulphate of ammonia industry, encourage the building of by-product coke ovens, arrange for securing in case of war the sulphate of ammonia, benzol and toluol necessary for making munitions, and if the prospective amount of these materials was inadequate, encourage the further building of by-product coke ovens, rather than build a hydroelectric plant? Private capital in the future will be just as ready to build ovens as it has been in the past, so why is the government obliged to spend $15,000,000 to secure something private capital is producing now. If it feels it has to spend money, why not spend it on the sulphate of ammonia industry, and not only secure benzol and toluol for itself, but during the 99 per cent of the time we are at peace, benefit also the farmer, dyemaker, coal miner, wood preserver, tar paper manufacturer, good roads builder, medicine compounder, and all those working directly and indirectly in the many ramifications of the coal tar industry.

Two years ago I visited most of the by-product coke ovens in the Durham and Middlesborough district in England, and a great many of the ovens in the triangle formed by Dusseldorf, Dortmund and Wesel, which is the lower Rhine Westphalian steel district. Having seen just before I left the practice and mechanical refinements of the Gary plant, the coke oven practice in Europe brought back very vividly the methods used here 10 years ago, and emphasized how entirely this country had gotten away from the old world's standards.

European Progress

In only two things which I saw, did I consider that they were in advance of us. One was a gas engine installation and the other the use of mixed gases. At one of the big German steel plants, they have a 10,000-horsepower gas engine installation, generating electricity, which cost them complete $300,000. That same installation in this country would have cost $1,000,000, which may explain why the large gas engine unit is less in vogue here than abroad.

The other instance was at Skinningrove, where Ernest Bury, who has contributed liberally to coke oven data in

a number of papers he has presented before various societies in England, took me through his plant. He was using a mixture of three volumes of blast furnace gas with one volume of coke oven gas, and getting a mixture about as follows: Hydrogen 13.25, methane 7.5, unsaturated hydrocarbons 0.5, carbon monoxide 22.75, carbon dioxide 9, nitrogen 47, B. T. U. per cubic foot, 206. He was using this gas in his gas engine to produce electricity and also in open hearth furnaces and soaking pits. The advantage of the use of these gases is that a constant supply of uniform composition and calorific value is always available. In good blast furnace practice, where the gases are efficiently washed, they are using about 30 per cent of the total volume of the gas for stoves, 7.5 per cent for boilers, and 12.5 per cent for blowing engines. There is a 5 per cent loss in washing, etc., leaving a surplus of available gas of from 40 to 45 per cent. This gas has a value of between 90 and 100 B. T. U. The volume of gas depends, of course, on the amount of air that is being blown and what the charge is, but in the case of a modern furnace will amount to 25,000,000 to 30,000,000 cubic feet per day per furnace. By mixing this gas of low B. T. U. value with the richer coke oven gas making an average of 200 to 250 B. T. U. per cubic foot mixture an increased supply of calorifically uniform fuel gas is obtained.

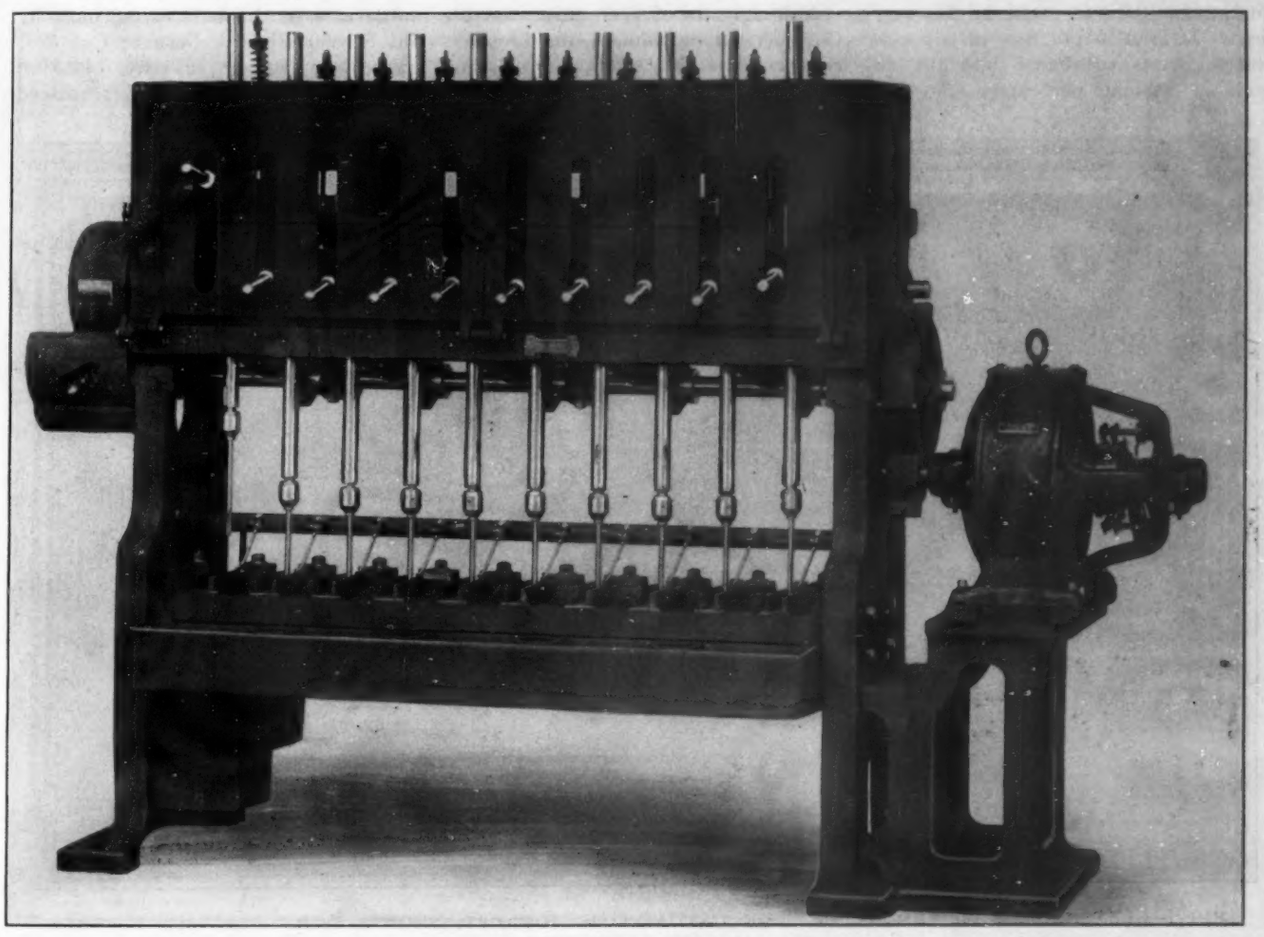
With the exception of these two things, European practice, except in ammonia and tar yields, is in no way comparable to present United States practice. In engineering developments and in production, we are immeasurably superior to our instructors.

The changes in operating practices occurring from day to day are so numerous, and may be so important, that one cannot help feeling that two years hence everything said now may be obsolete, excepting for the two principles involved, uniformity in the coke and regularity in the operation and in the temperatures of the ovens.

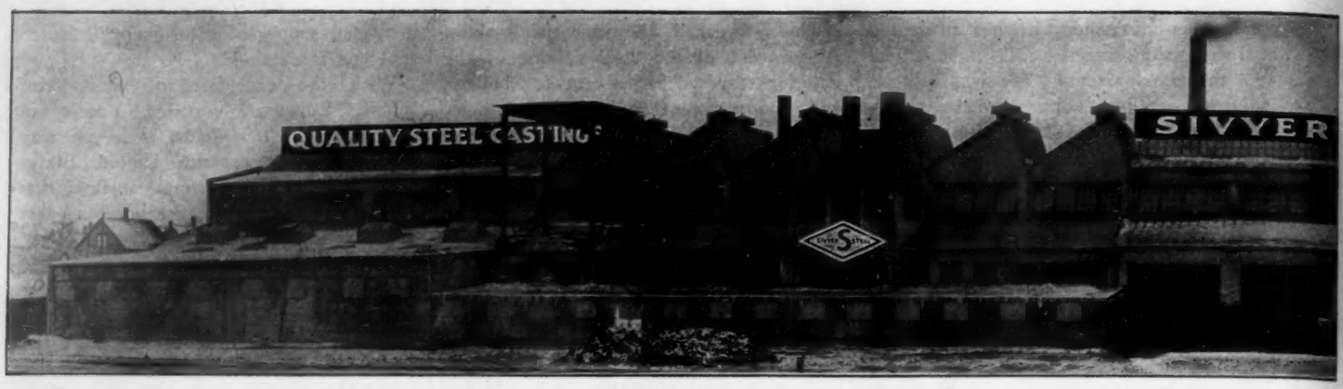
New 10-Spindle Automatic Nut Tapper

A 10-SPINDLE nut tapper has been developed by the National Machinery Co., Tiffin, O. The tap spindles are aranged in a single line within a space of 70 inches, thus bringing each of the taps within easy reach of the operator. The design of the spindles permits vertical adjustment to suit the length of the taps. The taps may be removed or inserted without stopping the machine. The 3-step cams are used to raise and lower the spindles and are so timed that the raising and lowering movements are in consecutive order. The cam shaft can be shifted laterally to engage the various cam steps.

The accompanying illustration shows one of these machines geared to a Westinghouse adjustable speed direct-current motor. By means of a drum control the speed of the cam shaft may be adjusted from 550 to 1,200 revolutions per minute, making the machine suitable for tapping nuts from ¾-inch to 1½-inch size. This control allows the revolutions of the tapping spindle to be varied to suit the number of threads on the tap used. These speed changes can be made while the machine is running.



MOTOR DRIVEN 10-SPINDLE AUTOMATIC NUT TAPPER MADE BY THE NATIONAL MACHINERY CO.



Panoramic view of the plant of the Sivyer Steel Casting Co.,

The Converter and Electric Furnace

A NOVEL and interesting application of the electric furnace to dispose of excess side-blow converter steel scrap has been made at the plant of the Sivyer Steel Casting Co., Milwaukee. Since neither sulphur nor phosphorus is reduced in the converter, the metal charged for conversion into steel must be of a definite composition within certain limits and the percentages of both sulphur and phosphorus should be as low as possible and under 0.05 per cent in the castings. It is the practice in all converter plants to charge into the cupola a certain percentage of shop scrap, but since the castings made in all of these foundries are light and the gates, sprue and heads constitute 50 per cent or more of the melt, an excess amount of scrap is produced which cannot be consumed and is sold in the open market. The use of too high a percentage of this scrap in the cupola mixtures, with the added increase of sulphur from the coke, would raise the sulphur content above the prescribed sulphur limits for converter steel.

Although the Sivyer Steel Casting Co. operates only one 1-ton Tropenas converter, its daily production of shop scrap, in the form of gates, sprues and heads is unusually large, due to the fact that from 22 to 23 blows are made from about 7:30 a. m. to 5:30 p. m. This practice far surpasses that of any other converter shop in this country and it is doubtful if it is equaled abroad. Heretofore the surplus scrap which could not be charged into the cupola has been sold, but since it is far more economical to use this material it was decided to install an electric furnace for the purpose of melting and refining it. The furnace is of the basic type, built by the Snyder Electric Furnace Co., Chicago, and has a capacity of 3,000 pounds per heat. It was first placed

FIG. 1—GENERAL VIEW OF THE SIVYER STEEL CASTING CO.'S FOUNDRY, SHOWING THE ELECTRIC FURNACE AND THE CONVERTER

Milwaukee, equipped to manufacture converter and electric steel castings

in the Manufacture of Steel Castings

in operation in April, cold stock being used. All of the surplus shop scrap now is being utilized in this way and the combination of the electric furnace and the converter, considering the economies that can be effected, has bright promises of further application. As shown in the general view of the foundry, Fig. 1, and in the plan of the plant, Fig. 15, the electric furnace is located in the same side of the shop as the converter and the cupolas, all of the melting and steelmaking being confined to one end of the foundry by this arrangement. A near view of the Snyder electric furnace is shown in Fig. 7. To remove the transformers and other electrical equipment for the electric furnace from the ground level and away from the dust and smoke of the foundry, the transformer house has been built on the roof to which access is had through an opening in the floor and by means of a ladder from the foundry. With this opening closed, the transformer room can be kept clean and it is well ventilated through windows in the sides and ventilators in the roof.

Organized in 1909 to engage in the production of crucible steel castings, the Sivyer Steel Casting Co. has enjoyed a phenomenal growth. The first plant was located in one of the buildings of the Northwestern Malleable Iron Co., Milwaukee, but in 1910 the growth of the business made necessary the erection of a small plant on the present site. In 1912 a 1-ton Tropenas converter was installed and two years later the elimination of the crucible furnaces was commenced, the entire output subsequently consisting of converter cast steel. The recent addition of the electric furnace practically doubles the capacity of the plant and to keep pace with the increased steel production numerous additions and extensions have been made. As shown in the plan of the

FIG. 2—GENERAL VIEW OF THE SIVYER STEEL CASTING CO.'S ORDERLY AND WELL-ARRANGED CLEANING DEPARTMENT

FIG. 3—A VIEW OF THE CLEANING ROOM LOOKING TOWARD THE SHIPPING FLOOR IN THE REAR

FIG. 4—TWO OF THE CHIPPERS' BENCHES, SHOWING THE INSPECTORS' SIDE AND SAFETY FIRST SIGNS

FIG. 5—UNDERGROUND EXHAUST FOR THE GRINDING STANDS, WHICH REMOVES ALL OVERHEAD PIPING

plant, Fig. 15, the foundry is 90 x 375 feet and paralleling practically one-half of the length of the shop are the concrete raw material bins, 190 feet long. At right angles to the foundry is the recently completed cleaning room, 75 x 153 feet, and in another building, in which the crucible furnaces formerly were located, are the core room, 50 x 70 feet; the carpenter shop, 50 x 70 feet, and the store room, 25 x 70 feet. The pattern vault is located in a detached, one-story structure, approximately 50 feet square.

Arrangement of Melting Equipment

As illustrated in the ground plan, Fig. 15, the cupola in which the iron is melted is located adjacent to the converter, reducing to the minimum the distance the molten iron must be carried for charging into the steel-making vessel. In the same end of the shop, and at a distance of about 45 feet from the converter, is the Snyder electric furnace. The two sand mixers are directly opposite and adjacent to the sand bins, thereby minimizing the hauling distance of the sand to the mixers. One of these mixers, recently installed, is of the Simpson intensive type, and was furnished by the National Engineering Co., Chicago. The cupola is lined to a diameter of 38 inches and is operated continuously to provide metal for the converter. Two oil-fired ladle heaters are provided, one for heating small hand ladles and the other for bull ladles. As far as possible, the molds are poured directly in front of the converter and electric furnace. All the snap-flask work is conveyed to this end of the shop for casting, although the larger molds are poured in the sections of the shop in which they are made. This scheme permits of the employment of a separate pouring and shake-out gang, and, furthermore, confines to one part of the plant the smoke incident to pouring-off and the dust and dirt arising from shaking-out. It also is conducive to an orderly, well-kept foundry, which is the first essential for good work. The molding and casting department is commanded by two 5-ton, Pawling & Harnischfeger overhead traveling cranes.

Conveying Molds to the Casting Floor

The casting floor of the foundry is in the immediate foreground of Fig. 1, and several floors of snap flasks represent the work of the operators of the power squeezers, which parallel the wall directly opposite the electric furnace. Snap flask molds from the other squeezer floors on the opposite side of the shop and ad-

jacent to the jolt machine floors, instead of being placed on the floor for pouring off, are set on long steel channels, and these, when filled, are conveyed by crane to the casting floor. One of these steel channels containing eight molds, lifted by a crane, is illustrated in Fig. 12. Special hooks engaging pins on the channel are looped by chains from the crane. At *A*, in the foreground of Fig. 12, is one of the channels with only one mold in position. Attention also is directed to the steel bands on these molds which eliminate the use of slip jackets. These bands are placed inside of the snap flask when the mold is being made and when the flask is removed remain in position. The use of these steel bands eliminates all danger of a crush which occurs occasionally when slip jackets are forced down upon a mold.

Casting Grid is Useful

An interesting piece of home-made equipment is the casting grid, shown in Fig. 11. After shaking-out the castings, they are piled on this grid for delivery to the cleaning department, the surplus sand falling through the grid openings. Four eyes are cast on the grid for the insertion of the crane hooks. Lip-pour ladles only are used, bottom-pouring not being resorted to even for large work. The molding machine equipment consists of four Tabor power squeezers, eight hand squeezers of the Farwell type, eight Tabor and Herman jolt-ramming machines and one Pridmore stripping plate machine. Air is furnished by two electrically-driven and controled automatic air compressors, built by the Chicago Pneumatic Tool Co., located in rooms partitioned off in either end of the foundry, as shown in Fig. 15. Locker rooms are located on the floors above the compressor rooms and an emergency hospital also is provided.

Raw Material Bins

As illustrated in the ground plan, Fig. 15, the concrete raw material bins parallel the foundry a distance of 190 feet. These are partitioned off in size according to the material to be stored, the largest being used for sand. It has a capacity of 1,000 tons. This is sufficient for the entire winter's stock and insures a constant supply in good condition. In the 17 individual bins constituting this series are stored ferro-manganese, ferro-silicon, sand blast sand, limestone, fluorspar, fire clay, charcoal, silica flour, core sand, ganister grit, coke, etc. A siding from the belt line tracks parallels the bins and through openings on a level with the

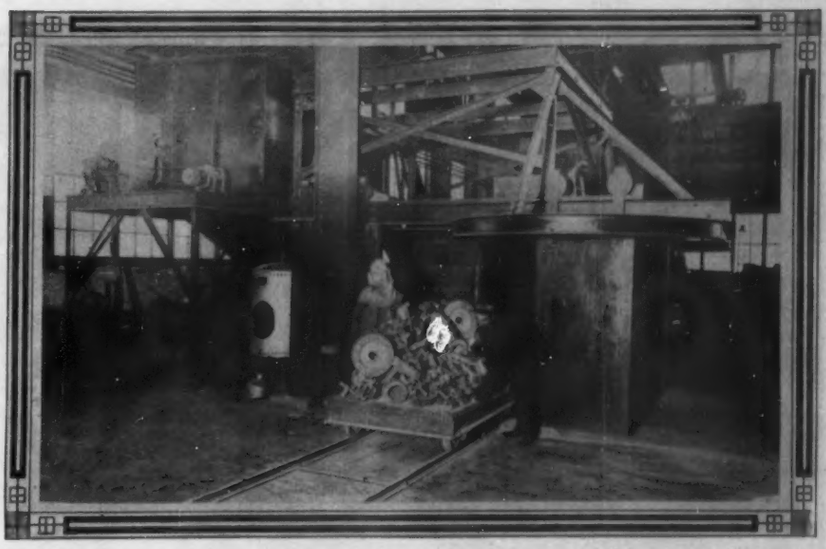


FIG. 6—SAND BLAST ROOM, SHOWING THE CAR ON WHICH THE CASTINGS ARE CLEANED

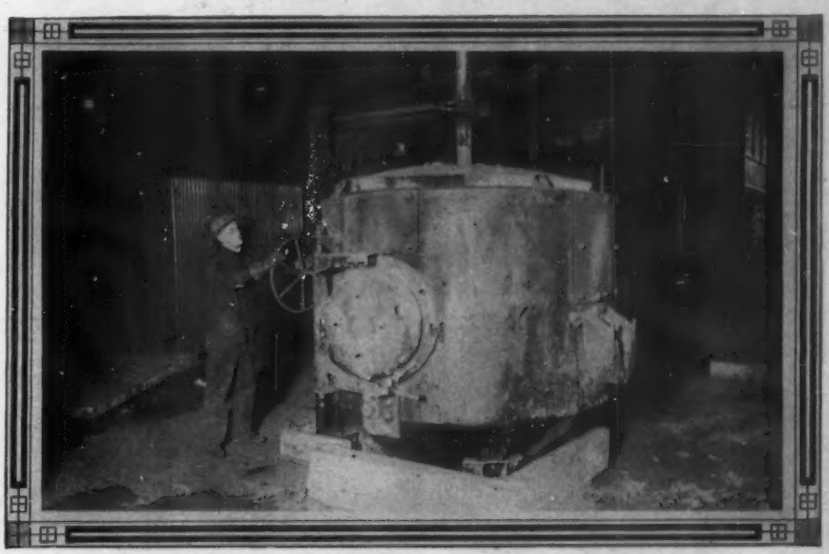


FIG. 7—THE SNYDER ELECTRIC FURNACE HAS A CAPACITY FOR PRODUCING 3,000 POUNDS PER HEAT

FIG. 8—A WELL-ARRANGED BATTERY OF HACK SAWS FOR CUTTING-OFF GATES, RISERS AND SPRUES AND FOR SLITTING CASTINGS

FIG. 9—PATTERN ON A FOLLOW-BOARD AND DRAG HALVES OF MOLDS FOR MOTOR TRUCK WHEELS

FIG. 10—DRAG HALF OF MOTOR TRUCK WHEEL MOLD AND MOLD FINISHED READY FOR CLAMPING

FIG. 11—GRID FOR CONVEYING CASTINGS FROM THE POURING FLOOR TO THE CLEANING DEPARTMENT

FIG. 12—ONE OF THE STEEL CHANNELS ON WHICH SNAP FLASK MOLDS ARE DELIVERED TO THE POURING FLOOR

cars, the raw material is unloaded. To facilitate the making of the monthly inventory of raw materials on hand, the bins are lined off every 12 inches from floor to ceiling, and by ascertaining the dimensions of the material in each bin, the volume or amount on hand can be determined easily.

The pig iron and scrap storage occupies the yard space between the concrete bins and the end of the foundry. Gates are provided in the tops of the fence which are opened when unloading pig iron and scrap from cars. A gravity carrier also will be installed to facilitate unloading. Each car of pig iron is piled separately in the yard and its number and analysis are recorded in the office.

Cleaning Department

The general arrangement of the cleaning room, which is 75 x 153 feet, is illustrated in Fig. 15, and a view of this department from the shipping end toward the foundry is shown in Fig. 2 and Fig. 3 is a view from the opposite end looking toward the shipping floor. The building, which is provided with a sprinkler sysem, is of steel and brick construction, divided into three bays, the middle bay being served by a Pawling & Harnischfeger overhead traveling crane of three tons capacity.

It will be noted that the building is well lighted and ventilated and the floor is laid with creosote wood block furnished by the Ayer & Lord Tie Co., Chicago. It is the intention, also, to lay a similar floor in the core shop. The orderly condition of the cleaning room, which in most casting plants usually is in a chaotic condition, is particularly striking, and the scientific arrangement of the equipment has resulted in a greatly increased output and a large reduction in the cleaning cost. It will be noted that the grinding stands parallel the middle bay, with half of these machines in of the side bays. The chippers' and inspectors' benches are adjacent to the shipping floor and the tumbling mills are on the opposite side of the middle bay. After being shaken out in the foundry, the castings are loaded on a car on rails leading into the sand blast room, Fig. 6, this track extending out into the cleaning room. From the sand blast the small castings are taken to a sprue cutter for the removal of the gates and sprues after which they are inspected, and if found defective are delivered to the welders. To facilitate this operation and to prevent the cracking of the castings, they are heated in an open fire before welding. After welding, the castings are delivered to the grinders for smoothing-up the weld and grinding other rough spots. This sequence of operations insures the movement of the castings in practically a straight line from the time they enter the cleaning room until they are shipped. The sand blast room, with the dust arrester, shown in Fig. 6, was installed by the W. W. Sly Mfg. Co., Cleveland, while the sand blast machine was furnished by the Pangborn Corporation, Hagerstown, Md. For the handling of large castings, the sand blast chamber is provided with an I-beam trolley which encircles one end of the room. The welding outfits are of both the electric and oxy-acetylene types.

FIG. 13—ANNEALING FURNACE, SHOWING CAR CONTAINING ANNEALED CASTINGS

FIG. 14—ANNEALING FURNACE OPEN WITH CAR INSIDE

The castings are ground on 10 double grinding stands, each individually motor-driven and provided with exhaust hoods. It will be noted from Fig. 5 that the main exhaust pipe is laid underneath the floor, all overhead piping thereby being eliminated. The compressed air lines into the cleaning room also are underneath the floor, which greatly improves the general appearance of the department.

Chipping and Inspecting

The chippers' and inspectors' benches are unique in design and are substantially constructed of steel angles, bars and plates. As illustrated in Fig. 4, the tables are divided in the center, the chippers operating on one side and the inspectors on the other. The inspectors' side of the table is shown in this view. The steel center partition with the swinging doors is pro-

vided for the purpose of preventing chips from hitting the inspector, and after chipping, the castings are pushed through the hinged doors onto the inspectors' table for final examination before shipment. The pipe connecting with the air line underneath the floor, which delivers compressed air to the pneumatic tools used by the chippers, passes up between the benches and has branches for each table. The chippers' tables are drilled at various points for the insertion of plugs to serve as rests for the castings. The four tumbling mills are driven by individual motors and are provided with overhead exhaust.

The annealing furnace, shown in Figs. 13 and 14, is of a distinctive type, designed and built by the Sivyer Steel Casting Co., and is of sufficient capacity to anneal the entire output of the plant. The furnace is oil-fired, the inside floor dimensions being 8 x 9 feet and it is 11 feet high on the burner side and slopes to 8 feet 9 inches on the opposite side. The track on which the two annealing cars operate is 40 feet long and the gage is 3 feet 6 inches. The track is depressed, thereby bringing the top of the car, which forms the floor of the furnace, on a level with the cleaning room floor. The cars are coupled together and when one is withdrawn from the furnace with its load of annealed castings the other is pulled into the furnace with a load of castings to be annealed. The cars are hauled into and out of the furnace by the cleaning room crane, a wire cable operating on a sheave, to which the crane hook is attached, being employed. A view of the furnace with one door partly open and a car inside, is shown in Fig. 14. The door is made of fire brick with a structural steel framework and is suspended from and is operated on an I-beam. The two trolleys which support the door are attached to it by a parallelogram linkwork and it is moved back and forth by a hand-operated chain belt as illustrated in Fig. 13. The two oil burners enter the furnace at one side as shown in Fig. 4, an individual air system being provided, the blower and motor being located on the roof.

Annealing Temperatures

The temperature of the furnace is recorded by a pyrometer furnished by the Hoskins Mfg. Co., Detroit. The furnace is built of fire brick and is substantially supported by structural steel members.

The cars are of heavy steel construction and are so thoroughly insulated that no heat can be detected underneath them when the furnace is at its highest temperature. To thoroughly seal the oven a curved, V-shaped lip is cast on either side of the car, extending its entire length, as shown at *A*, Fig. 14, and steel flanges on both sides of the oven overhang into these lips. The openings between the lips and the flanges are filled with sand, thereby effecting an air-tight seal. When closed, the door is locked in position as shown in Fig. 13.

The furnace has an annealing capacity of about 20 tons daily and many experiments were conducted to ascertain the proper annealing temperature for steel castings. The time required for the anneal is about six hours, the castings being heated to a temperature of 1,650 degrees Fahr., where they are held for about an hour. After they have cooled below the critical temperature of 1,100 to 1,200 degrees Fahr., it has been ascertained that they can be safely removed from the furnace. A car of annealed castings, just removed from the furnace, is shown in Fig. 13.

A well arranged battery of hack saws, which is part of the equipment of the cleaning room, is shown in Fig. 8. The saws are used for cutting off heads and risers and also for slitting castings to detect imperfections. The first casting on all new work is cut apart to detect defects and many recurring old jobs are investigated in the same careful manner to insure sound castings.

A large part of the work of this foundry consists of motor truck wheels and the method of molding one type is illustrated in Figs. 9 and 10. These wheels are 36 inches in diameter and have rims 5 and 6 inches wide, respectively. In the rough they weigh 235 pounds each and 180 pounds after machining. The drive side of one of these wheels is shown at *B*, Fig. 14, and wheels showing the opposite side are on the annealing furnace car, Fig. 13. As shown by the pattern, Fig. 9, the inner side of the wheel contains a wide flange and the rim is cored throughout. The pattern on a follow-board is illustrated in Fig. 9, as well as several drags in incompleted stages. Fig. 10 shows a finished drag with the cores in place

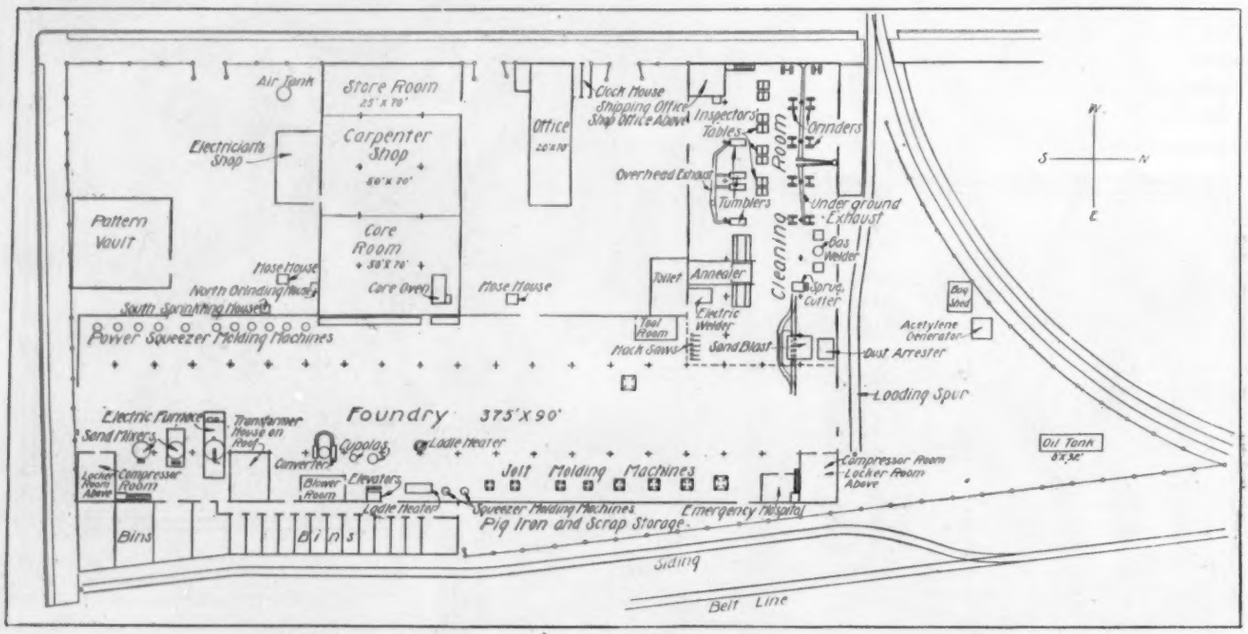


FIG. 15—GROUND PLAN OF THE PLANT OF THE SIVYER STEEL CASTING CO., MILWAUKEE

ready to receive the cope. The circular rim core is made in four segments, the center core in three segments and in addition, there are hub and gate cores. The mold ready for clamping is shown in Fig. 10, and it will be noted that it is provided with four large risers. On Saturday, March 25, the Sivyer company received a rush order for these wheels for motor trucks for United States army service in Mexico. On the following Wednesday the first shipment of wheels was made, which were both sand-blasted and annealed, and shipments continued at the rate of 25 a day until the order was filled.

That "Safety First" is the underlying principles of all the operations of this plant is indicated by the orderly condition of all of the departments, which is the first essential in the prevention of accidents and the production of high grade work. The chief inspector also is head of the safety department and the recommendations for the installation of safety appliances are made by a safety committee consisting of one member from each department. Meetings are held every Tuesday afternoon and the recommendations are reported in writing to plant executives for their consideration. The members of this committee are constantly changing, affording each employe an opportunity to serve.

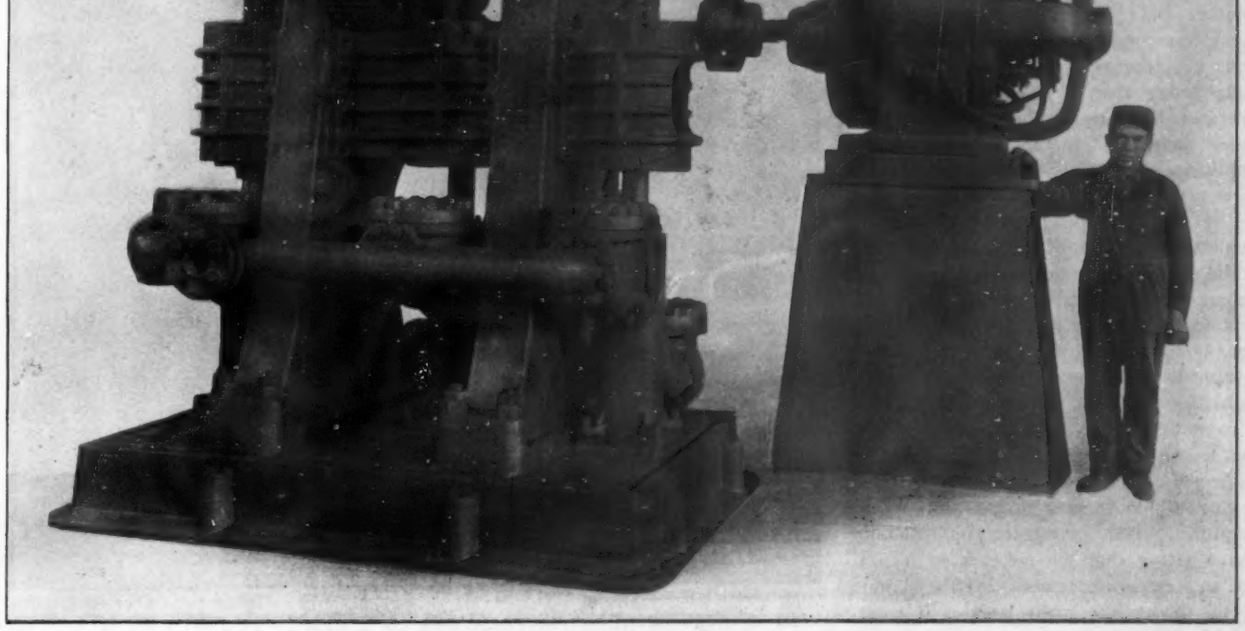
Promoting Safety

To promote interest in the prevention of accidents, bulletin boards are conspicuously displayed in all departments, containing suggestions for safeguarding health and life. These bulletins are changed from time to time and the employes are urged to read them. Chippers, melters and all employes handling molten metal are forced to wear goggles and congress shoes for the molders are bought in large lots by the company, being sold to the men at cost. Safety signs also are permanently displayed in various departments. Two of these signs are shown on the chippers' benches in Fig. 4. Some of the permanent signs follow. "Fight dangerous practices, play it safe;" "Always be careful, keep your head;" "Accidents don't just happen, each one has its cause," etc. The safety work has greatly reduced the number of injuries to employes, and furthermore, it has installed a spirit of orderliness and care which has beneficially affected the operation of the entire plant.

A group insurance policy has been written on the lives of all of the employes of this company on the following basis: $1,000 for all employes in continuous service two years or more; $750 for continuous service less than two years and more than one year, and $500 for continuous service less than one year and more than six months.

Vertical Triplex Hydraulic Pump

THE accompanying illustration shows a vertical triplex hydraulic pump, designed and built by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio. It is of the pot valve type and is said to be capable of delivering a large volume of water against a high pressure. The volume and pressure depends upon the diameter of the plungers which may vary from 4 to 5¾ inches. With each plunger making 45 strokes per minute, the 4-inch plungers have a capacity of driving 88 gallons per minute against a pressure of 1,700 pounds per square inch. In the same length of time the 5¾-inch plungers will deliver 183 gallons against a pressure



POT VALVE TYPE VERTICAL TRIPLEX HYDRAULIC PUMP

of 800 pounds per square inch. Each plunger has a stroke of 12 inches, with a speed of 45 strokes per minute.

On account of the large volume of water which this pump is designed to handle, each plunger is equipped with pot valves for both the suction and delivery chambers. They permit the use of light checks which have greater freedom of movement than a large single check would have. The lift of the checks also is reduced, thereby cutting down the slippage. This pump is designed for direct connection to a 100-horsepower motor. It is fitted with reduction spur gears, the first reduction being five to one and the second three to one.

Measures Heat Directly

A NEW pyrometer has been placed on the market by the Gibb Instrument Co., Highland building, Pittsburgh, Pa. Instead of indirectly determining the temperature of material by measuring the furnace temperature, the new instrument directly measures the temperature of the piece. The pyrometer is shown in Fig. 2.

The manufacturers of pyrometers have gone far in removing guesswork from heat treating processes. Some thermo-electric pyrometers give accurate measurements of the temperature at the point of installation. Incredible results have been obtained by the old time furnaceman who treated steel by color because he judged the temperature of the piece, not the furnace. A few of these men are still treating steel and, although their furnaces may be equipped with thermo-electric pyrometers, the treatment is still done entirely by the eye. It is claimed that while pyrometers are in general use as auxiliaries, 85 per cent of the actual heat treating is still done by the eye. The lack of uniformity in the product by this method is due solely to the lack of a permanent comparative color. The old time furnaceman obtained better results than another only because he could better carry this comparative color in his mind, and he frequently obtains better results today than the furnaceman who operates his furnace by the seemingly more scientific methods because he duplicates by the eye the temperature of a previously treated object.

The Gibb pyrometer claims to exactly duplicate the color of heated bodies and at the same time indicate the temperature on an accurately calibrated scale. It is said to be possible for the user to read the temperature of the piece under treatment to a fine degree of accuracy, regardless of the furnace temperature. It is not necessary to take into account the length of time the body has been subjected to the specified temperature in order that it may assume this temperature. The pyrometer immediately shows either that the piece is or is not up to temperature and, in the latter event, shows how many degrees it must absorb to reach the prescribed temperature. Relative to the sensitiveness of the human eye and its ability to distinguish shades of color, an interesting experiment was carried out by Prof. E. L. Nichols of Cornell University. He placed 92 shades of blue before 54 men. The average for properly distinguishing these shades was 95 per cent.

The operation of the pyrometer is so simple that it is claimed it can be placed in the hands of an unskilled workman. It is designed for the more precise temperature measurements of high grade steels under treatment, and is made in two ranges; 1,000 to 1,800 degrees Fahr. and 1,800 to 2,300 degrees Fahr. It can also be used for taking the temperature of heated bodies either within or without a furnace. This makes it possible to obtain temperatures of heated steel in the form of ingots, billets, rails, armor plates, etc. Fig. 1 shows how the instrument is used.

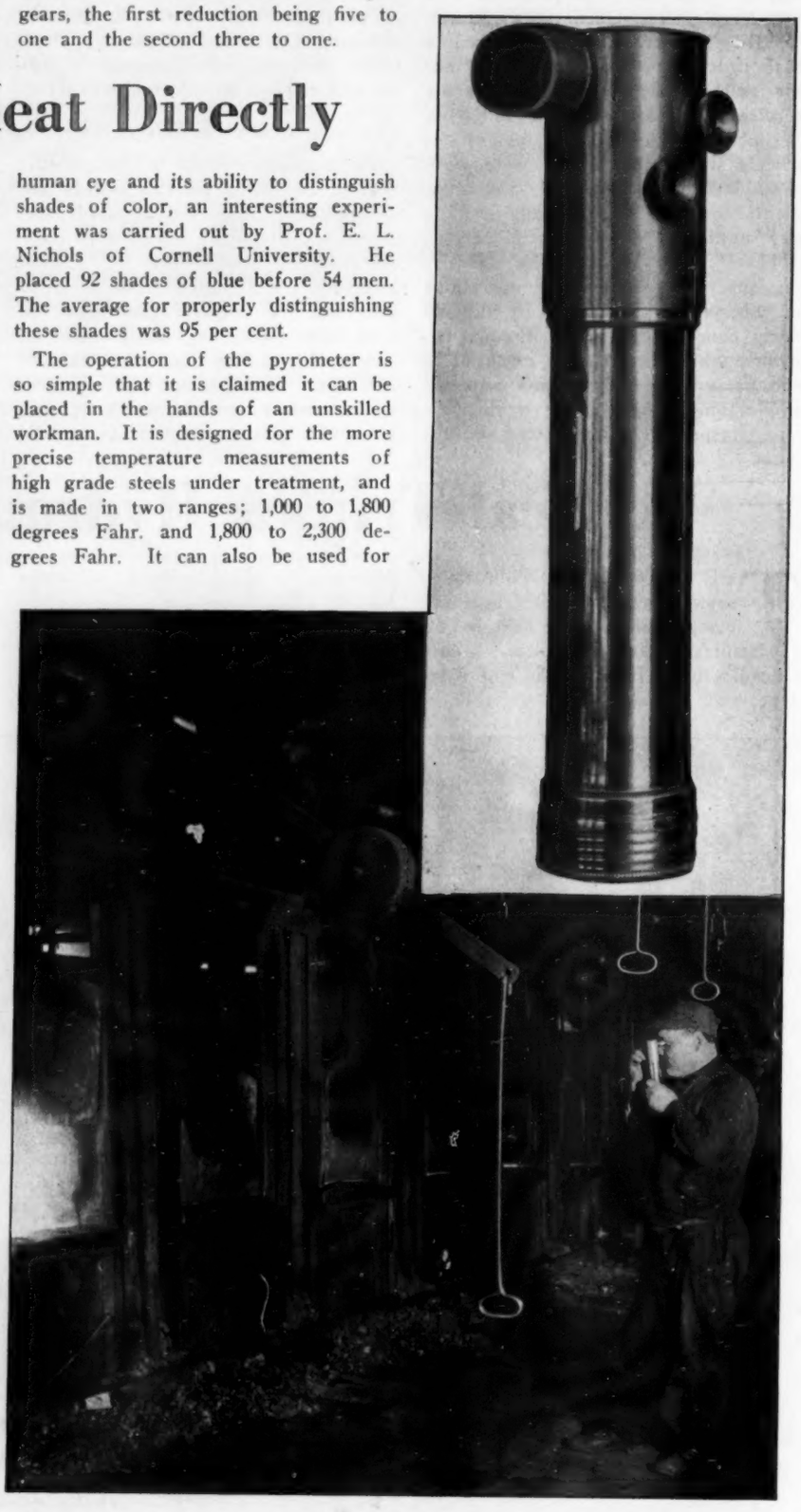


FIG. 1—DETERMINING TEMPERATURE OF STEEL IN FURNACE BY MEANS OF GIBB PYROMETER. FIG. 2—PYROMETER MANUFACTURED BY THE GIBB INSTRUMENT CO.

WHAT'S WHAT and WHY

Don't Ask Yourself-Ask Us!

Questions from our Readers answered by Experts

Exports to Canada

What were the exports of leading iron and steel products from the United States to Canada during the six months ending Dec. 31, 1915?

Exports of leading iron and steel products to Canada for the six months ending Dec. 31, 1915, figured on a tonnage basis, were as follows:

	Gross tons
Iron ore	568,707
Pig iron	37,794
Scrap	10,003
Bar iron	1,970
Wire rods	35,190
Steel bars	48,057
Billets, ingots, etc	50,192
Bolts, nuts, rivets and washers	2,273
Hoop and band iron, etc	4,511
Horseshoes	145
Nails, tacks, etc	211
Railroad spikes	361
Pipes and fittings	5,945
Radiators, etc.	639
Steel rails	4,470
Iron and steel sheets, galvanized	10,618
Iron sheets and plates	5,241
Steel plates	63,834
Steel sheets	33,783
Structural iron	58,348
Tin plates, etc.	22,987
Wire, barbed	5,487
Wire, all other	13,866

Manganese Ore Deposits

Where can I obtain information in regard to the manganese ore deposits in California?

Descriptions of a few deposits in the state of California were published in bulletin 427 of the United States Geological Survey, on the manganese deposits of the United States. This bulletin was issued in 1909, and since that time the following miners of manganese ore in California have been listed by the United States Geological Survey:

W. P. Thomas, Ukiah, Mendocino county; Shasta Copper Co., Shasta county, offices 29 Swazey building, Redding, Cal.; N. A. Marshall, Needles, San Bernardino county. Some new mines have also been opened in the Livermore-Tesla district. Certain features of the industry were mentioned in the mineral resources chapter on the production of manganese in 1914. The state mineralogist of California devoted 12 to 15 pages on the subject of manganese ore in the county descriptions published in his report for 1914-1915, issued in July, 1915. A copy of this report may be obtained from F. McN. Hamilton, state mineralogist, San Francisco. An article by S. H. Dolbear on certain manganese deposits in California was published in *The Mining and Scientific Press*, vol. 110, p. 172, 1915.

About Billets

What is the difference, if any, between re-rolling billets and a forging billet? Why is it that the latter command the higher price?

A forging billet is made of re-rolling steel and is similar to a re-rolling billet in most respects. When an ingot is rolled down for forging purposes, a 25 per cent crop usually is taken from the ingot to prevent the occurrence of blow holes. Should the billet show any seams, chipping apparatus is used to remove them. Forging billets are guaranteed by most manufacturers. Most buyers of forging billets insist upon special specifications; the carbon content of a forging billet generally runs from 0.15 to 0.20 per cent. Because of the scrap loss and because of guaranteed analysis, makers ask a higher price for forging than for re-rolling billets. Under normal conditions, the differential is about $5 a ton.

The Largest Iron Mine

We would like to learn what mine in the Lake Superior iron district has shipped more ore than any other.

The records of *The Iron Trade Review* covering the shipments from that district since its opening, up to the beginning of this year, show that the Norrie Group on the Gogebic mine is the premier shipper. Its shipments total 31,666,773 tons. This group comprises several mines. The record for one mine rests with the Hull-Rust, Mesabi range, which has forwarded 27,168,716 tons.

Alabama Coke Production

What was the production of coke in the Alabama district in 1915?

The Iron Trade Review correspondent at Birmingham, Ala., sends the following reply to the above question:

"I have yours in regard to coke. The 1915 coke figures have just come out. The year 1915 was an exceedingly hard one in the district, both as to production of coal and coke. The revival in the coke trade really did not start until well into the fourth quarter of last year—so it was a little late to have much effect on the year's business. There were produced 2,780,976 tons of coke. While the inspector of mines has not segregated the figures with reference to by-product and bee-hive coke, it is safe to say that 80 per cent was by-product coke, or 2,224,781 tons; and the balance, 20 per cent, was bee-hive coke—556,155 tons. Three and a half million tons of coke is our record—which I think was in 1912 or 1913. According to my way of figuring, the year 1916 will show 4,500,000 tons of coke. Of this I believe by-product will represent 3,500,000 tons and 1,000,000 tons of bee-hive coke."

Cost of Shells

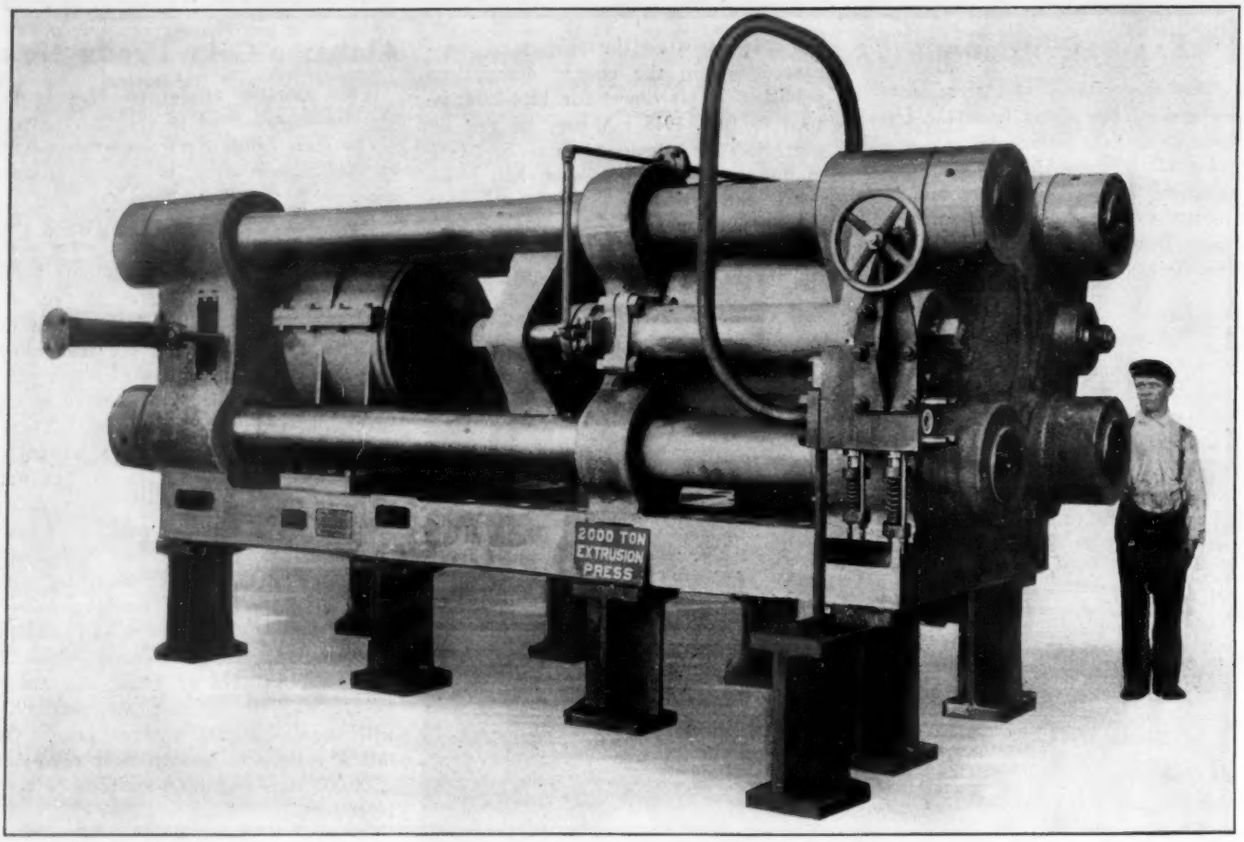
What are the prices of some of the ordinary shells that are being manufactured in this country?

At the present time, the ordinary English 4½-inch VI shell is being manufactured in this country for $9.81. In England, 6-inch shells cost $19.90 at the outbreak of the war; the price in Canada and the United States is now $16.85. Prices are being reduced as the British government finds itself able to get larger supplies at home. A long war may result in further reductions. The prices quoted are for shells alone and do not include the cost of the powder or of the cartridge cases into which the shells are loaded for use in quick firing guns.

Develops 2,000-Ton Extrusion Press

A four column extrusion press has been developed by the Southwark Foundry & Machine Co., Philadelphia, the design and method of operation having been worked out in a way which is said to insure a high rate of production with a low cost for tool upkeep and power. The press is arranged for extruding billets 5¾ inches in diameter and 25 inches long weighing about 200 pounds. It has a capacity of extruding 30 billets per hour. It is designed entirely of special steel castings and forgings with the exception of the main ram and some minor parts which are of close grain cast iron.

The method of operation is such that no annealing is required and the extrusion is completed in a single operation. For operating the press a 12 x 12-inch accumulator is recommended, arranging with a steel ballast tank accommodating ballast to weigh about 250 pounds per cubic feet. The advantage claimed for press equipment operated by an accumulator is that the life of the dies and containers is much longer than when operated from a pump direct, and the production also will be greater. The accumulator is fitted with a special safety valve which prevents dropping at a dangerous speed even though a pipe line should fail. The safety valve also acts as a governor and automatically regulates the extruding speed to that which is most economical. The press has a cast iron table 50 inches long to support the extruded rods and between this table and the back edge of the press there is a 30-ton cutting-off press to sever the ram stump of the billet from the die block. The stroke is of ample length to enable the press to be used for drawing out copper tubes after the container castings are removed. The pressure chamber is made of special alloy steel which has a high tensile strength and is provided with a jacket through which the heated gases from the fireplace beneath the chamber are passed so that the chamber is heated to the required temperature. The gases escape through a pipe located above the pressure chamber to a temperature of 600 degrees Fahr. The chamber is heated so that the metal blocks may not be suddenly cooled when placed in position. If they were cooled suddenly the surface of the metal would lose its plasticity thereby unduly varying the extrusion operation or making its successful performance a practical impossibility. The high temperature to which the walls of the pressure chamber are raised during the time in which the extrusion operation is being performed requires the chamber to be made of special steel.



2,000-TON PRESS FOR EXTRUDING 200-POUND BILLETS. THE MACHINE HAS A CAPACITY OF 30 BILLETS PER HOUR

Motor Delivery Cheaper

With a view of drawing a comparison between the performance of a motor truck and the work of a team of horses hauling an equivalent burden, the Kissel Motor Car Co., Hartford, Wis., has made public the accounts of the delivery costs of a firm which is using both horses and motor trucks. According to the figures presented, the cost of operating a 4-ton truck, including gasoline, oil, tires, repairs, depreciation and the wages of driver and helper, amounts to $8.68 per day. The truck averages four loads of four tons each within a radius of five miles which is a delivery charge of about 55 cents per ton. Two good horses under favorable circumstances will make two trips a day within a delivery radius of five miles, but the load will be limited to three tons. The cost of operating this team amounts to about $5 per day, so that without considering the advantage of the motor truck in the way of greater area of deliveries, rapidity of trips, continuous service, etc., the cost of delivery per ton is much cheaper with a motor truck than with horses.

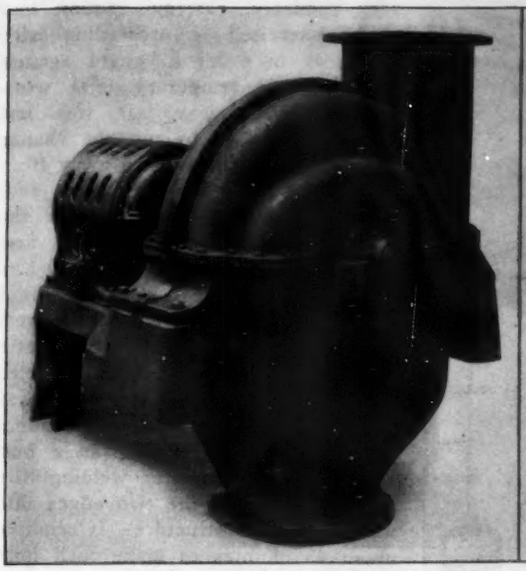


Fig. 1—Ingersoll-Rand Turbo Blower for Furnishing Blast to Cupolas

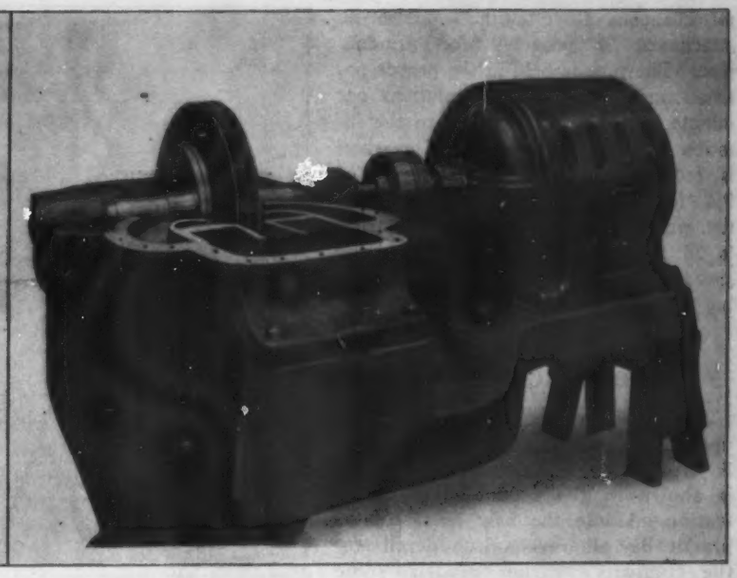


Fig. 2—Blower With Upper Casing Removed, Showing Double-Flow, Enclosed Impeller

Introduces Low-Pressure Turbo-Blower

THE Ingersoll-Rand Co. has added to its turbo compressors and blowers a low pressure machine to handle volumes from 3,000 to 35,000 cubic feet per minute at from one to two and one-half pounds per square inch.

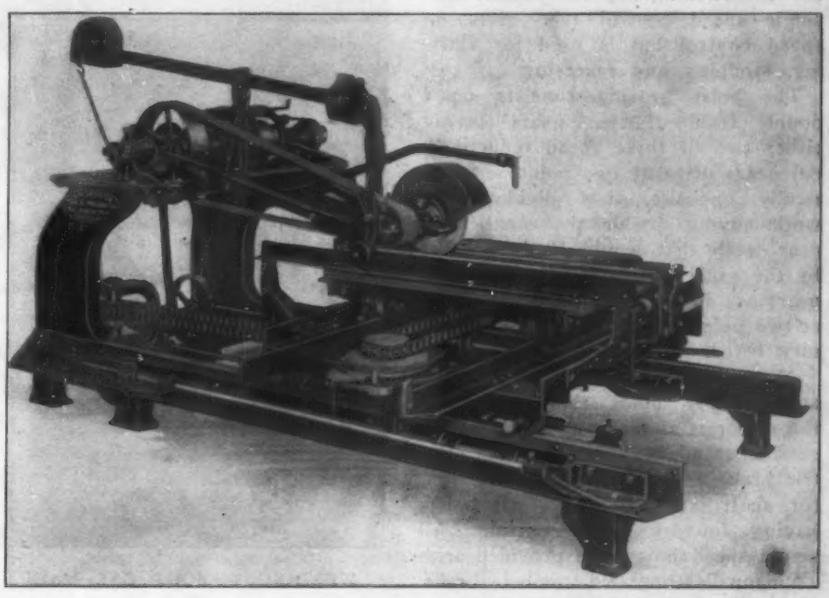
This machine is particularly adapted to such service as foundry cupola blowing, atomizing oil for oil burners, supplying blast to heating and annealing furnaces of various kinds, blowing air for water gas generators, pneumatic conveying and ventilating.

It is of the single stage, double flow type and may be either electric motor, steam turbine or water wheel-driven. Electric drive is generally employed for the classes of service mentioned and in the case of the turbo-blower, the high operative speed permits direct coupling to motor, a first cost economy. The motor-driven turbo-blower is designed to maintain constant pressure, while delivering any volume from zero to a maximum demand, proportionately varying the electrical horsepower input.

The casing of the blowers is split horizontally for ease in installation and subsequent inspection. The assembled casing is doweled and bolted to a heavy sub-base, which ordinarily serves for both blower and driving element. The blower occupies small floor space and its vibrationless operation obviates the necessity for foundation bolting. The impeller is of the enclosed double flow type. The wheel is machined from a solid, special steel forging. The vanes and covers are of riveted pressed steel. The impellers are overspeeded in a testing machine to insure correct balance, strength and to eliminate vibration. They are keyed to a heat-treated, forged steel shaft. Labyrinth packing is employed to prevent leakage between impeller and casing. The bearings are ring-oiled and both bearings and their housings are horizontally split. Flexible couplings are used between the blower and the driving unit.

Automatic Grinding and Polishing Machine

A new automatic grinding and polishing machine has been developed by the Excelsior Tool & Machine Co., East St. Louis, Ill. The principal features of this machine are shown in the accompanying illustration. The main swing-frame is provided with roller-bearing connections which permit a free movement over the work being polished. It is stated that the pressure on the grinding machine has been developed by the pounds; this pressure is regulated by hanging weights on the balance arm, as indicated in the illustration. The machine is completely automatic in operation and is designed to run continuously. It is arranged specially for grinding, surfacing and polishing flat, semi-flat or oval shaped castings, and also for grinding and polishing metal plates and pipe. It is specially adapted for handling



GRINDING AND POLISHING MACHINE OF SWING-FRAME TYPE

miscellaneous stove castings. Also an attachment is provided for grinding pipe. The pipe is held in the proper position and revolved 350 revolutions per minute in a direction opposed to the rotation of the grinding wheel. The wheel is fed across the pipe at the rate of 9½ feet per minute. When handling flat work the travel of the lower truck is 58 feet per minute. The foregoing speeds can be reduced one-half by shifting the belt drive on the cone pulley.

A New Electric Hoist

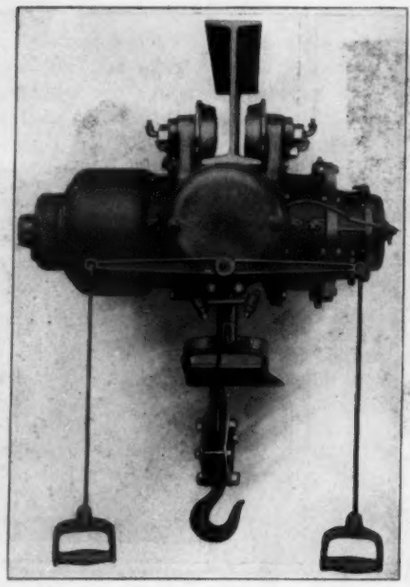
A new electric hoist recently developed by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., is shown in the accompanying illustration. While the new hoist retains practically all mechanical details of the company's earlier models, some changes have been made in gear construction. The gears of the new hoist are heat treated, in order to increase their own durability and as well as the life of the hoist.

The hoist frame consists of two cylindrical castings, flanged and joined to each other at the center of the hoist by turned through-bolts. The outer ends are closed by bonnets secured to the frame by bolts. One of these bonnets encloses the motor, while the other covers the receptacle containing the gearing and brakes. All moving parts are thus protected from injury.

The motor is a standard series-wound slow-speed crane motor. When the hoist motor is running without load its speed is about two and one-half times its full load speed. The controllers are of either the foundry type or single speed type. The foundry control type gives from 13 to 17 running speeds while the single speed control type gives no speed control but is used for starting, stopping and reversing.

The hoist gearing consists of a double train of spur gears having either two or three speed reductions. All gears drive at two points diametrically opposite, thus dividing the work among double the number of gear teeth that would be in contact by the usual arrangement. Since the gears are in a double train, breakage at two points at once would be necessary before the load would fall.

A mechanical brake is used, which automatically holds the load when the motor is at rest, and prevents excessive speed in lowering. An electric brake applied directly to the motor shaft is provided for all hoists having foundry type control. All single speed hoists are provided with a manually-operated motor brake.



NEW ELECTRIC HOIST

The hoist is built upon the unit system, all parts being readily accessible. The motor, controller and gearing as well as the mechanical brake, electric brake, limit switch, and winding mechanism are each independent of the other and each may be removed without disturbing any other unit.

Welding Gas Mains by Oxy-Acetylene

A remarkable gas main construction job was recently completed at Waco, Tex. Two mains of extra heavy pipe of ⅜-inch wall and 10-inch diameter were laid across the Brazos river under unusual difficulties.

Owing to the fact that the Brazos river at this point frequently rises very suddenly, extreme caution had to be exercised in proceeding with the work in order to guard against the pipe and temporary false work being washed away. It was not thought advisable to run the chance of having the pipe washed away from the top of the false work by a sudden rise of the river. Therefore the 20-foot lengths of pipe were first welded together by the Prest-O-Lite oxy-acetylene process into 100-foot sections in the pipe ditch on the west side of the river, well above the water line. Owing to the fact that beveled end pipe had not been ordered, it was necessary to set the pipe lengths about ⅜-inch apart so as to make a butt weld, using Norway iron welding wire as a filler, fusing the two edges into a homogeneous structure. It required about 45 minutes to make each joint on the unbeveled 10-inch pipe.

WELDING 100-FOOT GAS MAIN

These welds were first tested for strength by placing a block under the joint. The weight of two men was supported, one at either end, without affecting the joint, in spite of the leverage of the combined weight of the pipe itself and the men at the ends. A pressure test was later given each welded section by subjecting it to 90 pounds gas pressure.

After the 100-foot lengths of the submarine section of the gas mains had been welded together in the pipe ditch at the side of the river, at about the same level with the top of the false work, they were pulled out over the false work for the final welds.

The accompanying illustration shows the operator completing the joining of the 100-foot sections. The welder was followed by a workman who painted the pipe with an asphalt coating. Burlap was then wrapped around the pipe and coated with asphalt. A second wrapping of burlap was then given, with a final coat of asphalt.

Drop Forge Convention

The annual convention of the American Drop Forge Association will be held at Philadelphia, June 9 and 10, and manufacturers of drop forgings are invited to attend this gathering.

If the Snyder Electric steel furnaces recently sold, and those in operation today were suddenly mobilized for war service on a 24-hour basis, they would turn out 77,975 tons of steel every 12 months, or within 40 per cent as much steel as all the electric furnaces operating in Germany,, which are now producing at the rate of 129,000 tons per year.

Fallacy of Eight-Hour Movement

Exposed at Convention of National Metal Trades Association

Much Attention Given to Labor Troubles—Tavenner Bill Denounced—President Rice Discusses Conditions in a Clean and Vigorous Address—James A. Emery Tells of the Coming Industrial Warfare

THE eighteenth annual convention of the National Metal Trades Association, held April 27-28, at the Hotel Astor, New York City, was the best attended in the history of the organization, the total registration being 372. Interest centered largely about the subject of labor troubles, which the members, along with practically all other manufacturers throughout the industrial centers of the country, experienced in greater abundance during the past year than in many years past. The extent of the strike wave was reflected in the report of President Rice, who said that strikes among the members of the association in 1915 numbered 67, compared with five in 1914. Detailed reports were submitted by Commissioner John D. Hibbard and Secretary Homer D. Sayre, covering the activities of the association during the year. These showed, among other things, that the 8-hour day has been adopted by the manufacturers of the country in an exceedingly limited scale, and the extent of the 8-hour movement has been of far smaller proportions than published reports would indicate. Important features of the convention were an address on "Industrial Preparedness", by James W. Emery, and a report on the work of conference boards by M. W. Alexander. Among the resolutions adopted were the following:

Protesting against the so-called Tavenner bill which would make it illegal to pursue any time-studies in government operated plants, and heartily indorsing the letter of Secretary Baker to Speaker Clark in opposition to the bill.

Exhorting manufacturers to co-operate in the work of obtaining an inventory of plants and manufacturing facilities in order to promote the country's state of preparedness.

Protesting against efforts which are under way to supplant the present system of weights and measurements by the metric system.

Commemorating the career of the late Melville H. Barker, formerly president and honorary member of the council of the association.

The history of the association during the year, as well as the experiences and sentiment of its members, was summarized in a report of the president, H. H. Rice. The lessons learned during the past year and which may be applied to the immediate future, formed

W. H. VANDERVOORT,
The New President

an especially interesting portion of Mr. Rice's paper. He said in part:

It can hardly be said of our association that this has been an uneventful year. From five strikes in 1914 to 67 strikes among our members in 1915, not to count those outside of our membership but in which we are interested, is a considerable increase in business. Those of you whose business has doubled or trebled can imagine the situation in which we found ourselves.

In membership we have kept about the same because we could not give attention to that side of our work. Many firms would join if we could go after them. I recommend we do so now but always with quality of membership rather than quantity in mind. We could not do better than to employ some one to solicit and investigate applications for membership as we did at one time. Time is ripe for such a movement. Wilmington, Syracuse, Buffalo, Toledo, Detroit and Columbus should have branches now. Other cities should follow.

Present conditions have made new demands on our office with which it has been impossible to keep abreast. We have done the best we could. The commissioner and secretary have worked at high pressure, as indeed have all the office and field force.

Neither the commissioner nor your council make any claim to unusual powers of discernment, but it would be strange indeed if those who have these labor problems put to them daily should not from experience gather a fund of knowledge in the psychology of strikes in general, and of the present strikes in particular—for this has been a time peculiar to itself. A few simple but fundamental principles were stated at the beginning as applicable to the present difficulties and events have proved them correct.

First: *The agitation for eight hours was not a demand on the part of the men but not of union officials.* The men, of course, were glad of overtime rates after eight hours as they would be after six or four, but they wanted and gladly accepted the chance to work longer than eight. (Incidentally what has become of the argument that as much can be produced in eight, as in nine or ten hours, when everyone who is busy works over eight except those who try to run three shifts?)

Second: *What the men wanted was larger wages—not shorter hours, except in name.*

Third: *It would not be possible to run three eight-hour shifts generally* or even for a few to do so. Those who tried it have not been able to fill the third shift even at special wages. In fact, many found it difficult to fill a second shift.

Fourth: *Concessions would lead to further demands.* In almost every case such was the result.

Fifth: *That while the occasion required longer hours and not shorter, it was the time for higher wages.*

Sixth: *That the proper way to give increases was for individual merit and by bonuses, premiums, and payments for efficiency and production.*

Seventh: *That though we were opposed to horizontal increases, there were instances when it seemed the only thing to do.*

In the light of events, these statements seem to have needed no proof, but so little do most manufacturers think of their labor problems that many had to be argued with, sometimes without effect.

Speaking generally this is a story. Everybody quiet and on short time. War breaks out and a semi-panic seizes business. Then almost overnight a resumption of trade in machinery lines—and lo! everybody is busy all at once.

The big munition plants begin bidding up the price of labor to rates unheard of in our day. Careless for the most part of the future, of principles, of hours or of wages—everything is sacrificed for immediate gain and often in total disregard of other industries and manufacturers.

But of that attitude we can say little. Have not our fellow manufacturers (even our own members at times) shown an inclination to follow this example when their own business became so much better than they ever dreamed?

What of the immediate future? Those who predict will do well to speak as oracles but a few things may be said with assurance.

First—No one who does not wish to do so need change his hours. Everywhere men are working overtime and it becomes a matter of wages—not of hours. Some have thought that a change to overtime pay after eight hours would leave them with a lower hourly rate when times become normal. So it would, if they did not have to increase the hourly rate now as all have had to do either individually or collectively. In not one single instance do we know of anyone getting away with an overtime rate only.

Second—The men have no grievances and do not wish to strike. The union is in no condition to fight and has notified local lodges they would have to finance themselves if they wished to call strikes.

Third—Where wages are right and in accord with present demand (and where they are not they should be made so) there is no occasion for anyone being stampeded into making changes in fundamental working condition because he "read in the paper" that everybody was changing to eight hours, when as a matter of fact not 1 per cent are actually working eight hours and not 5 per cent are nominally doing so. This afternoon in the experience meeting you may learn the facts. Also in the secretary's report will be found a brief tabulation of the hours and wages prevailing in the shops and localities of our members. It may surprise some who have believed reports without investigating.

What would you think of a manufacturer who insured in the same mutuals with you and who let his shop get into an untidy condition with his extinguishers empty, his sprinkler system out of order and careless fire hazards everywhere? You would say that he owed an obligation to yourself and the other mutual members and that he was not entitled to assistance in case of fire.

Are you such a member of the Metal Trades? Do you give the labor conditions in your shop any attention until you hear of rumors of organization and demands? Are you one who makes no effort to determine the character and previous history of new men who are put on and do you take an interest in the physical condition of your shop and in the treatment accorded to men by their foreman so as to have the good will of the workmen as a strong asset?

We are sometimes asked what are the obligations of the association to a member. It is quite pertinent to reverse the question. What are the obligations of the member to the association?

Hours and wages, it is true, are matters of local and individual concern, but no man can make changes at a time like this without affecting all about him and if he makes changes without consulting his association as to *whether such changes will accomplish what he is after, whether they are necessary, whether the men want them in the way the unions propose whether, if granted, they will decrease or increase the likelihood of further demands,* he is just as foolish as the manufacturer who does not ask his attorney's advice before taking important legal steps.

Your membership in your association entitles you to the combined experiences of all the other members and may be had for the cost of a 2-cent stamp.

The relation of the branches to the national is most harmonious, but the association would be infinitely stronger if arrangements were made to have all secretaries answerable to and even appointed by the national office. The national returns to the branches one-half of all dues, but has little or no voice in the expenditure of that money. Requests may be made but no orders given. A closer relationship would stimulate activity in the branch itself and would open the way for the training and promotion of secretaries from smaller to larger fields. A committee has been appointed to consider this question. I recommend that in co-operation with the branch presidents and the secretaries themselves, some plan shall be adopted and tried in at least a few of the branches at once.

Where possible—and it seems as if it should be possible in every branch—I recommend a rotation in office, a practice already in vogue in some branches. This acquaints more members with the work of the branch and of the national and *a man never loses interest after having served the association*

The result of the joint committee appointed to follow the hearings of the industrial relations commission should have special mention since its work is now finished and was so successful. The committee, through its counsel, Walter Drew, was able to get in the records much favorable testimony which would never have been in without our effort, and which it is suspected was not welcomed by the chairman and some others on the commission. It showed some testimony in its true light by suggesting pertinent questions. I may say it even educated some of the members of the commission by supplying them information with the result that the chairman, whose outbreaks in speech and print merited the ridicule they received, found himself and his friends on the minority side of the report. And last of all, our committee has made known to congress the attempt on the part of Chairman Walsh to make it appear that the minority report was the majority report and get it published as such.

The freedom offered the investigators of the federal trade commission to make themselves at home in our office and acquaint themselves with every activity of our association was an answer in itself to those who hoped to find objectionable activities on our part.

The reports of the commissioner and secretary will not give you an adequate idea of the busy year they have spent. Let me give emphatic testimony to their great efficiency and self-sacrificing loyalty. Neither can I speak too highly of the work of the labor department and of the office force.

THE NEW OFFICERS

W. H. Van Dervoort, of the Root & Van Dervoort Engineering Co., East Moline, Ill., is the new president of the association, having been advanced in the customary manner from the vice presidency.

The first vice president is George Mesta, of the Mesta Machine Co., Pittsburgh, and the second vice president, J. W. Higgins, of the Worcester Pressed Steel Co., Worcester, Mass. F. C. Caldwell, of H. W. Caldwell & Son Co., Chicago, was re-elected treasurer.

Councilors for two years were elected as follows: B. F. Tobin, of the Continental Motors Co., Detroit; H. N. Covell, Lidgerwood Mfg. Co., Brooklyn; Murray Shipley, Lodge & Shipley Machine Tool Co., Cincinnati; R. H. Jeffrey, Jeffrey Mfg. Co., Columbus, O.; H. B. Kennedy, Hoggson & Pettis Mfg. Co., New Haven, Conn.; Theodore O. Vilter, Vilter Mfg. Co., Milwaukee. Herbert H. Rice, Waverly Co., Indianapolis, retiring president, was elected a member of council to fill the unexpired term of J. W. Higgins.

Tavenner Bill Denounced

The objections voiced by Mr. Rice in regard to the provisions of the so-called Tavenner bill now pending in the house of representatives, were shared unanimously by the members of the association. This sentiment materialized in the adoption of a resolution, disapproving the Tavenner bill and urging united action in securing its defeat. The resolution expressed the entire concurrence of the members of the association in the request for the defeat of this bill recently made by Secretary-of-War Baker upon the speaker of the house of representatives.

The association took formal notice of the recent creation of the naval consulting board and adopted a resolution declaring that the co-operation of the nation's industries in achieving adequate defense, is of the utmost importance to the country, in view of the vast supplies needed in time of national peril. The resolution expressed a hearty endorsement of the steps which now are being taken to obtain an in-

ventory of all industries. Such an inventory not only should result in a better knowledge of sources of supply for the government in case of national need, but also will assist the members of the association to a better realization of the possibilities of their own manufacturing plants. It, therefore, was resolved that the members should cooperate heartily with their own state committees in furnishing the desired information.

Address of Jas. A. Emery

Jas. A. Emery, counsel of the National Council for Industrial Defense, delivered an address in ringing tones in which he directed attention to the need for industrial preparedness. "I believe this nation faces war," said Mr. Emery, "not a sanguinary contest between thundering cannon but an economic contest between the commercial and industrial forces of the old world and the new, a desperate contest of economic methods and organizations for the marketplaces of mankind—a battle that began with the first traders and will continue as long as men produce more than they can consume.

"I fear we are permitting ourselves to be lulled into a sense of commercial security. The sunlight of a quick and astounding prosperity has dissipated the gloomy shadows that less than two years ago darkened our factory windows and cast black discouragement upon the anxious faces of an ever-increasing army of unemployed and an ever-enlarging body of workless manufacturers. Facing a continually increasing depression, the misfortunes of others suddenly re-energized our sickened industry. Locked in a death struggle and called upon overnight to organize a continent in arms, Europe reached to us for every necessity, almost without thought of its price. But this abnormal condition is to pass with the circumstances that brought it into being. Military peace in Europe will but renew with increased acuteness the pressure of economic necessity that is the primary cause of this titanic struggle."

Desperate Nations

After recounting statistics which showed the huge development of our export trade since the war broke out, while at the same time showing a decrease in the volume of exports to non-belligerent countries, Mr. Emery said that it is apparent that if peace comes within a reasonable time, unless Europe fights herself in to helpless exhaustion, we shall face not an imperative demand for a huge volume of export but the commercial challenge of desperate nations, driven by economic necessities to recover their lost trade, trained hard and lean, and fortified with unprecedented industrial experience, which manufacturing for self-defense has brought to each belligerent power, and disciplined in self-sacrifice and ordered in efficiency in the sternest of all schools —war. At the close of the war, he said, England still will be the carrying master of the world with Germany a close second. The United States, he said, undoubtedly, would still be compelled to rely on these two countries and would follow trade routes of their designation. He believed that our manufacturers will meet particularly harmful competition on the part of Germany. That country's loss of operating force by the casualties of war,

GEORGE MESTA
First Vice President

undoubtedly, is great, but the productive capacity of man, now at its zenith, has never yet been spurred to its full power, he said, and human ingenuity supplies a hundred fingers to multiply productive power of the human hand. Germany, undoubtedly, has lost for a generation her greatest customers in Europe and it, therefore, seems natural, that under the stimulus of her necessity, she will turn to this country and South America to market her products.

The association unanimously adopted a resolution protesting against the efforts of the director of the bureau of standards, legislators and others, to secure the passage of laws which would substitute the metric system for the standard of weights and measures now in use in this country. The engineering industry comprising the membership of the association, the resolution stated, is vitally concerned in the conservation of the existing system and realizes that any forcing of foreign standards, means confusion to industry instead of promoting uniformity. The several engineering societies participating in an inter-society committee to consider the feasibility of the adoption of the metric system following an agitation promoted by scientists and others, the resolution continued, do not fully appreciate the vital importance of this question in its industrial aspect, as well as in the habits of the people. It was pointed out that a great foreign trade already has been secured by the ready adaptation of American products to the needs of foreign buyers. without any legal enactment or government supervision; it was concluded that the efforts of the government, either through statutory enactment or through administrative action, should secure the promotion of uniformity on the basis of the present universally-used units, instead of encouraging new units and it was voted that this resolution should be brought to the attention of the inter-engineering society committee, the committees of the house and senate on coinage, weights and measures and the departments of the secretary and treasurer and commerce, as well as the press.

Denounces Metric System

This resolution was adopted largely as the result of the vigorous denunciation of the metric system by F. A. Halsey, of the *American Machinist*, New York.

"Superficially, the metric system is the most plausible thing on earth and one must go below the surface to see its fallacies," said Mr. Halsey. "One man wants it because he believes in 'anything decimal'; another wants it for 'uniformity' and another thinks it 'necessary for export trade'. It is through such superficial generalities as these that many make their decisions. The chief argument which now is being utilized to stimulate sentiment in favor of the metric system is its suitability for the export trade. The Hon. Jas. L. Slayden, member of the house committee on coinage, weights and measures, recently said 'If we do business in South America, we have got to do it on that system.'

"As a matter of fact, our product goes to metric countries where no one knows, asks or cares anything about the units of measure to which they are made. A careful census of the machine tools in South America, for instance, shows that 39.9 per cent are of American; 43.2 per cent of English and the

remaining 17.5 per cent of German, Belgain and French production, the total thus being 82.5 per cent, made to English and 17.5 per cent to metric measures. We are always told that the countries of South America are solidly metric, with the exception of British Guiana. They have the markets of the world from which to buy and no one will claim that German tools are not good tools. Nevertheless, these metric countries buy machine tools made to English measures, in preference to those made to metric measures, in the ratio of 6 to 1."

Henry D. Sharpe, of the Brown & Sharpe Mfg. Co., in discussing Mr. Halsey's remarks, said that a large portion of the sentiment in favor of the metric system is based on ignorance.

Training Apprentices

M. W. Alexander, of the General Electric Co., East Lynn, Mass., presented an interesting address on the "Work of the Conference Boards". After a brief reference to the work of the conference board on safety and sanitation, which has become familiar to thousands of employers throughout the country by reason of the bulletins distributed by the board and the various safety devices it has developed, took up the work of the conference board on training of apprentices, which was formed about a year ago. This board, said Mr. Alexander, was organized to co-ordinate thought and efforts in regard to the training of apprentices. It already has decided on a standardized form of apprenticeship agreement and on numerous details of the course of training. It has under consideration other important matters on which a determination shortly will be reached. He urged the hearty co-operation of the employers in the work of training apprentices, saying that as the ordinary public school training has proved that it does not produce the type of men and women needed in our industries, it is readily apparent that the responsibility must be assumed by the manufacturers. The board shortly will issue pamphlets which will contain advice as to how manufacturers may participate in the training of apprentices.

What probably will prove the most important of these conference boards, continued Mr. Alexander, is the industrial conference board which recently was organized and which will hold its first meeting on May 5. This board was organized to consider economical, legislative and industrial questions and is designed to coordinate opinions on matters affecting interests of employers and manufacturers, generally. It is made up of representatives of organizations whose combined memberships employ between 7,000,000 and 10,000,000 workmen. This board, Mr. Alexander hoped, is the forerunner of what possibly may be "the American Federation of Employers".

The committee on industrial education, of which Fred A. Geier is president, submitted a printed report of the progress in industrial education during the past year. The most important legislative feature of the movement for vocational education, the report said, was the introduction early in the present session of congress of the Smith-Hughes vocational education bill. This bill, which was reported favorably by the committees of the house and senate, was objectionable chiefly because is provided for a federal board consisting of five cabinet officers. The committee, as stated in the report, believed the personnel of this board should be composed of competent men representing commerce, labor, industry, agriculture and education, since a board composed of cabinet officers, necessarily would be unable to devote the requisite attention to the promotion of industrial education. Vocational education serveys were made during the year at Richmond, Va., and at Minneapolis. Surveys also were made in the cities of Scranton, Pa., Cincinnati and Cleveland.

A resolution which received the unanimous approval of the members recorded the life and activities of the late Melville H. Barker, who died on March 9, 1916. "Uncle Barker", as he was known, always had been in faithful attendance at the annual conventions of the association and as a result of his loyal and disinterested activities in behalf of that body, had been for several years past an honorary member of the council. Mr. Barker was one of the promoters of the National Metal Trades Association and attended the preliminary meeting on Aug. 21, 1899, which resulted in its organization. He was a member of the administrative council from 1900 to 1906, in 1906-7 served the association as first vice president and in 1907-8 acted as president. His administration called for the exercise of unusual tact and ability, since the organization during that period was called upon to defend 126 strikes. Upon his retirement from the office of president, he was made an honorary member of the administrative council and was re-elected each year thereafter.

The convention committees were as follows:

Credentials: W. D. Tynes, Hardie-Tynes Mfg. Co., Birmingham, Ala.; F. P. Johnston, Detroit Screw Works, Detroit; Wm. Rowan Jr., Morton Mfg. Co., Muskegon Heights, Mich.

Resolutions: Justus H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia; Geo. I. Alden, Norton Grinding Co., Worcester; H. W. Hoyt, Great Lakes Engineering Co., Detroit; L. C. Walker, Aeromotor Co., Chicago; Herbert E. Goodman, Goodman Mfg. Co., Chicago.

Constitution: F. K. Copeland, Sullivan Machinery Co., Chicago; B. F. Tobin, Continental Motors Co., Detroit; A. E. Newton, Reed-Prentice Co., Worcester.

Auditing: Wm. H. Bellman, Shaw-Kendall Engineering Co., Toledo; Franklin Farrel Jr., Farrel Foundry & Machine Co., Ansonia, Conn.; J. R. Kilbourne, the Kilbourne & Jacobs Mfg. Co., Columbus, O.

Convention: F. C. Breakspear, A. G. Spalding & Bros. Mfg. Co., Chicopee, Mass.; G. A. Kissel, Kissel Motor Car Co., Hartford, Wis.; E. J. Ross, Dibert, Bancroft & Ross Co., New Orleans, La.; P. R. Greist, Greist Mfg. Co., New Haven, Conn.; G. W. Mixter, Deere & Co., Moline, Ill.

Publicity: J. H. Schwacke, H. H. Rice and H. D. Sharpe.

The Annual Banquet

Cross-continental greetings by telephone were exchanged by President Rice and others with their colleagues in San Francisco at the annual banquet given at the Astor on Thursday evening, and this was the chief feature of that event. A telephone receiver was at the place of each diner, while at the guest table were both receivers and transmitters. Various cities were called up in turn until finally connection was obtained with San Francisco. President Rice exchanged greeting with Constant Meese, president of the California Metal Trades Association, at San Francisco. Walter Drew, commissioner of the National Erectors' Association, similarly conversed with John A. McGregor, president of the Union Iron Works, of San Francisco. Other conversations were carried on by those at the guest table. The only address at the banquet was delivered by Alexander Dana Noyes, financial editor of the *New York Evening Post,* who discussed financial conditions.

The National Machine Tool Builders' Association, many of whose members were present at the metal trades convention, held an executive session at the Astor Saturday morning and discussed matters of common interest to its members. This meeting was to take the place of the usual spring session.

Iron and Money: Fact and Comment

General Gains in Stocks Connected With Iron and Steel Manufacturing—Norfolk and Western Dividend Action Causes Much Discussion

DESPITE the uncertainty prevailing as to the result of the diplomatic correspondence with Germany, the past week was one in which nearly every stock connected with the manufacture of iron and steel made advances. The most decided change was in the case of Bethlehem, which gained 39½ points, compared with a loss of 48½ points the preceding week.

The market opened active and strong Monday and for the most part continued its progress throughout the day. Weak spots were confined largely to inactive stocks. The recovery of Mexican shares was a feature of the day, and Westinghouse shares were not adversely affected by the strike at the company's plant in Pittsburgh.

Tuesday the market seemed to reflect the feeling that Germany would offer concessions and that the severance of diplomatic relations would not be necessary. Railroad issues, as a rule, were strong.

The leading event Wednesday was the announcement of a dividend increase from a 6 to a 7 per cent basis by the Norfolk & Western railroad and the declaration of an additional dividend of 1 per cent. This action caused a great deal of discussion and some difference of opinion developed as to its wisdom.

Thursday it was more apparent that the Norfolk & Western declaration of dividend policy was having an important influence in stimulating confidence in the rail stocks. Union Pacific rose over 3 points to around 134, due, in part, no doubt, to the March statement of earnings, which indicated a net increase of $1,600,000. The B. & O. reported a net decrease, in spite of a liberal increase in gross earnings. This was attributed to more liberal expenditures for maintenance, which increased $1,700,000.

The market closed Friday with net gains predominating, although there were some irregularities. The increase in labor disturbances had some depressing effect on a few stocks.

Saturday, although Wall street was keeping an eye on the labor situation, cheerful sentiment continued to prevail. Some very unfavorable comment was made on the Norfolk & Western dividend increase.

Quotations at the close of business April 29 and net changes in the leading stocks identified with the iron and steel industry for the week are shown in the following table:

	Close Apr. 29.	Net chg.
American Can	57	+4½
American Can, prfd.	111	+2
Amer. Car & Fdy.	60	+4½
Amer. Car & Fdy., prfd.	116½	+ ¼
American Locomotive	73½	+9⅛
American Locomotive, prfd.	101⅝	+1⅞
American Steel Foundries	47½	+2⅝
Baldwin Locomotive	89	+3
Bethlehem Steel	459½	+39½
Bethlehem Steel, prfd.	135	.....
Colorado Fuel & Iron	42⅛	+2⅜
Continental Can	86½	+5
Crucible Steel	82	+7
Crucible Steel, prfd.	114½	+2½
General Electric	163	+4
International Harv. of N. J.	113	+3
International Harv. Corp.	73	+2
Internat'l Harv. Corp., prfd.	104⅞	—2⅛
Lackawanna Steel	70	+5
Nat'l Fnamel'g & Stmp. Co.	22¾	+3
Nat'l En. & Stp. Co., prfd.	93⅞	—2⅛
Pressed Steel Car	47	+3
Pressed Steel Car, prfd.	100	—1
Pullman Palace Car	161	+3
Republic Iron & Steel	47	+3⅛
Republic Iron & Steel, prfd.	108	+ ½
U. S. Cast Iron Pipe & Fdy.	20¼	+3⅜
United States Steel	83¾	+3⅜
United States Steel, prfd.	116½	.....
Westinghouse Mfg.	58	+4

The following table shows changes in maximum quotation of stocks not listed on the New York stock exchange:

		High Apr. 20.
American Radiator	395	397
American Ship Building	45	45¼
Cambria Steel	81¾	81¾
Chicago Pneumatic Tool	73⅞	70⅝
LaBelle Iron Works	53½	53½
Lake Superior Corpn	9⅛	10⅛
Stewart-Warner Speed Co.	85½	86¼
Warwick Iron & Steel	10½	10⅝
Westinghouse Air Brake	136½	137
Westinghouse Elec. & Mfg.	58¾	62¾

Receivers Appointed

Benedict M. Holden has been appointed temporary receiver of the Pierson Engineering & Construction Co., Hartford, Conn., a $45,000 corporation, which has liabilities of upwards of $150,000 and assets of $143,000.

Mr. Holden is also trustee of the estate of the R. G. Miller Contracting Co., Hartford, Conn., which has liabilities of $68,082.15 and assets of $65,000. He claims that he has been unable to get control of many of the assets in that they are claimed by different persons as security for money advanced to the corporation.

William J. Buckley, attorney, Bridgeport, Conn., has been appointed by the superior court as temporary receiver of the Cooper Aircraft Co., of that city, which seeks a dissolution. It is a $50,000 corporation making hydroaeroplanes, areoplanes, automobiles and motor boats. It was said to have orders for war aeroplanes for England and Russia. John D. Cooper, president of the company, who brought the proceedings, owns 250 of the 500 shares of stock.

A third dividend of 15 per cent has been allowed the creditors of the William A. Harris Steam Engine Co., Providence, R. I., in bankruptcy. This makes a total of 65 per cent that the creditors have secured thus far. Another smaller dividend will be paid later.

Will Build Plant

The Standard Screw Products Co., Detroit, has declared a cash dividend of 50 per cent, in addition to the regular monthly dividend of 1 per cent. The company, which recently doubled its capital, has purchased the entire block bounded by Bellevue, Warren and Theodore streets and the Michigan Central Belt Line railroad, upon which it will erect modern factory buildings.

Decided Change

The annual report of the National Steel Car Co,, of Hamilton, Ont., for the year ending Nov. 30, 1915, shows earnings of $737,871, as compared with a deficit of $6,680 for the previous year. After allowing $163,651 for repairs and renewals and writing off plant and equipment an amount of $127,500 net profits are shown at $446,719. After payment of dividends a surplus of $341,719 remained. The directors stated that the company had orders on its books amounting approximately to $10,000,000 and had made arrangements for special financing. The outlook of the business was good, as the first contracts for equipment for the British and French governments had given satisfaction and produced duplicate orders.

For Special Agent.—The bureau of foreign and domestic commerce, Washington, plans to hold an examination this month for the position of special agent to investigate the markets of South America for construction material and machinery. The salary will not exceed $10 a day, actual transportation expenses and an allowance for subsistence. Details of the examination will be announced later.

News of Employers and Employes

Threatened Strike in New England Failed to Materialize—Troubles in Many Cities—Many Wage Advances

MAY DAY was marked by feverish conditions of labor throughout the country, but on the whole conditions are not as bad as it was feared they would be. While some strikes of large size have been declared, particularly in the Pittsburgh and Youngstown districts, the newer strikes do not start off with the vim and vigor that would assure success to the strikers. The postponement of the general strike in New England is an important feature of the situation. While there has been some rioting among strike sympathizers at Pittsburgh, the strikes in nearly all parts of the country have been marked by no disorder.

Pittsburgh Conditions

Strikes and threatened labor trouble handicapped manufacturers at Pittsburgh to a considerable extent last week. Although numerous industries are affected by strikes, the general situation cleared Monday when an impending strike of machinists failed to materialize. The failure of labor agitators to declare a general strike of machinists jolted the eight-hour day issue severely.

The situation at the plant of the Westinghouse Electric & Mfg. Co., East Pittsburgh, where a strike was declared April 22, is unchanged. Only a few employes are working. The works of the Union Switch & Signal Co., at Swissvale, the Pittsburgh Meter Co., East Pittsburgh, the R. D. Nuttall Co., Pittsburgh, all Westinghouse interests, and the Shadyside plant of the Westinghouse Electric Co. were closed during the week by plant officials, as a precautionary measure. Strikers want an eight-hour day, the reinstatement of several discharged employes and assurance that the company will not discriminate against strikers when they return to work.

That the eight-hour day is opposed vigorously by manufacturers both at Pittsburgh and Youngstown, clearly is indicated by newspaper advertisements to the effect that manufacturers do not believe it advisable or possible under existing conditions, to change prevailing working schedules. The Pittsburgh Employers' Association has been formed by Pittsburgh manufacturers and a similar organization has been perfected at Youngstown.

Not more than 10 per cent of the 25,000 or 30,000 Westinghouse employes now idle are dissatisfied. Strikers are not organized; they have no leaders and they have not commanded public sympathy. F. H. Merrick, at one time editor of *Justice,* who is not an employe of the Westinghouse company, has been charged with an alleged attempt to incite a riot. Merrick is not identified with any labor organization. Several officials of the American Federation of Labor have been in Pittsburgh, but have not been successful in organizing the men.

Secretary W. B. Wilson, of the United States department of labor, has detailed Conciliation Commissioner Clifton Reeves, of Trenton, N. J., to represent the government in mediation of the strike and to co-operate in this work with the mediation board of the department of labor and industry of Pennsylvania. Dante Barton, of the industrial relations commission, as associate of George P. West, who attempted to break into the lime light by analyzing the recent strikes at Youngstown, and several other mediators have appeared at Pittsburgh. None of them has accomplished anything.

Allegheny county officials have prevented the sale of liquor in strike zones. Saloons in McKeesport, Braddock, McKees Rocks, Stowe township, East Pittsburgh, Wilmerding, Rankin, Wall and Pitcairn have been closed for almost a week. Order has prevailed throughout the strike zone for several days.

Thirty-one hundred motormen and conductors employed by the Pittsburgh Railways Co., the Washington and Charleroi interurban lines and the Beaver local lines went on a strike at midnight, April 30, for advances in wages. Thousands of Pittsburghers either walked to work or rode in jitnies Monday morning. The railroads have arranged temporary schedules to meet conditions caused by the strike of the motormen and conductors of the Pittsburgh Railways Co.

Frank P. Walsh, chairman of the industrial relations committee, and John Price Jackson, commissioner of the Pennsylvania department of industry, several international brotherhood officers and others discussed the eight-hour day issue at the Lyceum theater Sunday. Virtually every phase of the labor question was touched upon at the meeting, particularly that pertaining to conditions under which railroad men are employed. The meeting was similar to sessions recently held in other large cities throughout the country.

Not more than five plants employing machinists were affected by a general strike scheduled for today. Machinists had issued an ultimatum, declaring that they would refuse to work unless the eight-hour day was granted not later than May 1. Not more than 1,100 of the 25,000 machinists in the district are identified with labor organizations and it is apparent that machinists in general are satisfied with prevailing conditions. Several contract shops at Youngstown were made idle by a strike declared today.

Trouble in New England

The expected strike of machinists in New England manufacturing establishments announced by the international association organizers for May 1 did not materialize in a single shop and now June 1 is given as the date for which the owners may look for trouble from the unions. One of the reasons given for the failure of the campaign to be enforced is that the labor organizations are not ready to proceed. They lack preparedness, as it were. However, they are making preparations and doing quiet work in the various cities and towns where there are unions. The shop owners are equally alive to the situation and are ready for the break any time that it should come. They intend, or a majority of them do, to stick to the open shop principle and not give in to any of the demands that the unions may make. As a result, a long drawn out strike is expected in every city of any size in New England where machinery is made. That the strike of last September in Worcester, Mass., is a thing of the past is evidenced by the fact that the four plants involved, employing more than 2,500 hands, are all operating normal again, having exactly the same number of employes as before the strike. The machinists' union membership has dwindled from 2,400 to 400 and the men who left Worcester to work in other cities are returning and seek-

ing their old jobs. Consequently the union in that city is in no position to wage another strike now or even June 1. If a strike should come on the latter date, as predicted, it will affect the smaller shops rather than the big ones. Most of the big shops are paying bonuses and overtime wages, the men are receiving the highest pay in their lives and they appear to be satisfied and content to have existing conditions continue.

There has been no appreciable change in labor conditions in New England the past week. There were a few new strikes in Massachusetts and Connecticut, but they were of little consequence. One was at the plant of the Harrington & Richardson Arms Co., Worcester, Mass., where 40 metal polishers and buffers walked out, following the refusal of a demand for more wages and other concessions by the company. Two weeks ago, they asked for a general increase of $1 a day, along with other concessions, which was turned down. Last week, they demanded 50 cents a day which also was denied.

The polishers' strike in the Millers Falls Co.'s plant, Millers Falls, Mass., has been settled. A month ago, 30 of them asked an advance of 10 per cent in wages, which was refused. The settlement was brought about by a readjustment of prices, the men being all pieceworkers. The machinists who have been on strike for a 15 per cent increase are still out.

There is a strike of 50 molders at the Malleable Iron Works foundry, New Britain, Conn., because demands for a 25 per cent increase in wages were not forthcoming. The plant is still doing business, the gray iron workers not having yet gone out.

Wage Increases

The Morse Twist Drill & Machine Co., New Bedford, Mass., announces a bonus to its 1,200 employes and an extra dividend of $3 a share to its stockholders, the second extra of the year, that of January being $2 a share, making a total of $10 a share paid in dividends so far in 1916. The amount of bonus varies in accordance with the term of service, every man or woman on the pay roll sharing in the distribution. The notice posted by the company reads: "In appreciation of your co-operation and helpfulness, and trusting in their future continuance, the management presents you with the amount in the envelope you will receive today." The company is expending more than $200,000 in improvements at its plant, consisting largely of a big addition to its machine shop which will enable it to better cope with its orders.

The Coghlin Electric Co., Worcester, Mass., has advanced the wages of its 100 employes averaging 10 per cent, effective May 1. It has always operated on the open shop system.

The Spencer Wire Co., Worcester, Mass., has made a readjustment of wages in its Spencer, Mass., plant, by which each employe beginning May 1 will receive an increase of 5 per cent, in addition to the 6 per cent year's bonus payable July 1.

Sleeper & Hartley, Inc., Worcester, Mass., designer and builder of high speed automatic wire coiling machinery, announces that it is paying its employes a bonus of 10 per cent on their wages and salaries, for the quarter ending April 1.

The Rhode Island Perkins Horse Shoe Co., Valley Falls, R. I., announces a general increase in wages of its employes, effective May 1. The amount has not been determined.

All the 150 employes of the Westfield Plate Co., Thompsonville, Conn., have been granted a voluntary 15 per cent raise in their wages.

The Empire Knife Co., Winsted, Conn., has restored to the men in its blade finishing department the wage scale existing before a 5 per cent cut was made a year ago. It also agrees to give them an additional 5 per cent increase, effective July 1, which will also apply to piece workers.

Scovill Mfg. Co., Waterbury, Conn., which is paying extra dividends monthly during the war period, has declared an extra of 10 per cent, payable May 1.

Wage concessions in the works of the steel industry throughout the country lead the list in order of the proportionate amounts of money involved. At least one concern has granted its third increase within the last 10 months, making the present pay of many of its employes perhaps more than 30 per cent larger than was possible a year ago. A great many have offered their second general movements for advancing wages to go into effect May 1. Everywhere wages are reaching the highest previous figures and in the east those of laborers are making new high records. It has been estimated about 700,000 workmen are affected by changes in wages that take effect on May day. The amount by which these changes will benefit these workmen is probably in excess of $5,000,000 monthly.

The Bethlehem Steel Co. has announced a third general increase in wages of 10 per cent would be paid to its 24,000 employes, effective May 1. The first wage increase was given on Aug. 1, 1915. It is reported this last increase will add $170,000 to the monthly payroll of the company. The Pennsylvania Steel Co., a subsidiary of the Bethlehem Steel Corporation, today put into effect a 10 per cent increase in the wages of 7,000 employes at Steelton, Pa. Day laborers will receive 20 cents an hour in place of the former 17½ cents, and other employes will benefit by equal proportionate advances. The Maryland Steel Co., Sparrows Point, Md., made similar concessions to its 5,000 men.

Six thousand employes in the Monessen works of the Pittsburgh Steel Co., in Charleroi, Pa., will receive a second raise in pay equal to 10 per cent of their present salaries, it was announced Saturday.

According to the recent announcement of the United States Steel Corporation, a 10 per cent increase became effective May 1 in all the plants of its many subsidiaries. This, the second increase of this amount given within the last year, benefits 250,000 employes at a monthly extra expenditure of $1,660,000.

Pacific Coast Convention

The tenth annual convention of the United Metal Trades Association of the Pacific Coast was held at the rooms of the Employers' Association of Washington, Central building, Seattle, April 22.

At the morning session the reports of officers, including that of the treasurer, were received and the association was found to be in a flourishing financial condition and showing in every way a vigorous and healthy growth.

The question of continuing the issuance of a safety first bulletin was given consideration. The organization has issued two of these bulletins and the discussion referred to making it more attractive to the employes as well as larger and better in other ways. It was also brought out that it is considered essential for educational purposes to provide against heedlessness, carelessness, ignorance and indifference. The executive council will look into the matter.

At the afternoon session, general shop rules were debated, also the 9-hour day and the question of making sure that the efficient man shall have his due.

A visit was made to the Pacific Coast Steel Works, a local concern which recently installed two 50-ton open hearth furnaces.

Officers were elected as follows: Eugene Roberts, of the Puget Sound

Iron & Steel Works, Tacoma, president; A. M. Clark, Columbia Steel Works, Portland, first vice president; E. Johnson, Seattle Machine Works, second vice president; E. B. Truett, Hallidie Machinery Co., Spokane, third vice president; W. F. Prier, Oregon Brass Works, Portland, treasurer.

The convention closed with a banquet at the New Washington hotel. Covers were laid for 81. The speakers were William Pigott, president of the Manufacturers' Association of Seattle, and president of the Seattle Car & Foundry Co.; Antone G. Labbe, of the Williamette Iron Works, Portland; Eugene Roberts, of the Puget Sound Iron & Steel Works and others. T. B. Sumner, of the Sumner Iron Works, Everett, Wash., acted as toastmaster.

Welfare Work

The special program on welfare work of industrial concerns to be followed at the meeting to be held in connection with the national conference of charities and correction, at Indianapolis, has been enlarged to run over two days, May 16 and 17. It includes addresses on "The Function of Industrial Welfare Work," "Planning a Rapidly Developing Industrial Community," "The Hart, Schaffner & Marx Agreement," and "The Plan of the Ford Company at Detroit." All industrial concerns are cordially invited to participate. The general secretary is William T. Cross, City Club building, Chicago.

Make Good Showing

Washington, May 2.—Of all the principal manufacturing interests in this country, the iron and steel industry leads in the matter of increase in the amount of wages paid the past year. For the 103 iron and steel establishments reporting to the bureau of labor statistics, department of labor, it was shown that this increase for March, 1916, was 60.3 per cent, as compared with the same month of last year, while the increase in the number of employes was 36.2 per cent. It is shown plainly from these figures that the rate of wages also advanced sharply. The car building industry ranked second in the matter of increased amounts paid out in wages. For the 51 plants reporting, there was an increase of 51.8 per cent paid out in wages for March of this year, as compared with March, 1915, while the increase in the number of employes was 36.9 per cent.

The foregoing data form part of extensive data published this week in the May number of *The Monthly Review*, issued by the department of labor.

The number of employes on the pay roll of the 103 iron and steel plants reporting to the department totaled 105,190 for March, 1915, as compared with 145,318 employes for March of this year. Wages paid semi-monthly in March of last year amounted to $3,223,996, as against $5,167,920 in March, this year. Figures relating to February and March, 1916, cover 95 iron and steel plants, and show that the number of employes in the former month was 118,268, with a semi-monthly payroll of $4,211,272, as compared with 120,901 employes, with a semi-monthly pay roll of $4,272,717 in March, an increase of 2.2 per cent in the number of employes and an increase of 1.5 per cent in the amount paid as wages.

The semi-monthly pay roll for the 51 plants in the car building industry for March, this year, was $1,963,810, the employes numbering 60,839, comparing with $1,293,637 paid in wages semi-monthly and 44,449 employes in March, 1915.

Employes' Insurance

President W. C. Frye, of the Chain Belt Co., Milwaukee, has written a letter to every employe of the company who has been with it over a year, stating that all the employes who have been in the service of the company two years will be given insurance of $1,000, and those who have been in the employ one year will receive a policy of $500. The company is receiving many inquiries from manufacturers and others who desire further information in regard to the plan.

Proposed First Aid Law

An agreement to initiate at the state election the coming fall an entirely new first aid compensation law was reached recently at a conference held at Spokane, Wash., between committees representing the Employers' Association of Washington and the Employers' Association of the Inland Empire, with headquarters at Spokane.

The measure under consideration would give the workmen hospital and medical treatment for a maximum period of 90 days at a maximum cost of $150, the cost to be divided between the employer and employe. Two plans of procedure are to be provided. Under the first, which is designed to cover the cases of small employers, the employer would pay 2 cents daily to the industrial insurance commission for each employe, 1 cent of this to be deducted from the employe's wages. Under the second plan, the employer would be permitted to contract with hospitals or physicians for the care of employes, the cost to be divided in a similar manner.

Transportation of injured employes is to be borne by the employers in either case. If the contract plan should be accepted, the industrial commission will have general supervision over the hospital system. It is explained that this new measure will be in opposition to the measure supported by organized labor, which was criticised as being too drastic because of the fact that it placed the entire cost on the employers.

The conference adopted resolutions supporting the proposed constitutional amendment barring all but taxpayers from participating in bond elections and supporting the seven measures passed by the last legislature against which the referendum is being invoked.

Favors Open Shop

An organization for the promotion of the principle of open shop has been formed at Wilmington, Del., and it includes most of the city's leading manufacturing and industrial companies. The new organization has 213 members. The officers are: President, C. D. Garretson; vice presidents, John E. Healy and F. H. Gawthrope; secretary, C. G. Neese; treasurer, George W. Chambers.

Labor Notes

The Burton Powder Co., New Castle, Pa., has announced that it will give a 15 per cent increase in wages to employes.

The Steel Car Forge Co., Pittsburgh, has given men employed in its plant at Ellwood City, Pa., an advance in wages.

The Union Metallic Cartridge Co., Bridgeport, Conn., has established a permanent fire department at its works there, independent of that at the Remington Arms & Ammunition Co., which consists of 48 men, headed by a chief and two captains and divided into a day and night shift of 24 men each.

The Merchants Steel & Supply Co., Chicago, is now located in its new offices at 1810-1812 Continental and Commercial Bank building. The officers of the company are: W. K. Kenly, president; E. John Hicks, vice president; T. A. Schwengel, secretary.

Baker Aids Fight for Efficiency

Cabinet Member Points Out Fallacy of Unions' Position

Secretary of War Tells of Benefits of Scientific Management in Arsenals and Urges Congress to Defeat Tavenner Bill Which Penalizes Efficiency—Asks Special Investigation of Shop Conditions Before Legislative Action is Taken

RECRUITS are enlisting in the fight against the Tavenner bill. Help from an unexpected but powerful and influential source was received last week by those opposing this latest attempt to legislate efficiency methods out of government plants. Secretary of War Newton D. Baker, as pointed out briefly in last week's issue, strongly condemned the bill in a letter to Speaker Clark, of the house of representatives.

Secretary Baker stated bluntly that organized labor was behind the movement to pass the bill and then pointed out clearly the dangers of giving legislative countenance to any efforts to restrict a workman's output or earning power. The Tavenner bill prohibits time studies and premium payments in government arsenals. From such prohibition, it is but a step to forbid any shops where efficiency methods are employed. The serious import of the bill has stirred up strong protests from a number of manufacturers who from personal experience realize the wonderful benefits of scientific management both to the workmen and to the owner. The strong and courageous stand taken by Secretary Baker will add great strength to the movement of protest. The necessity for such action on his part only makes more emphatic the need for more manufacturers to enlist in the fight against the bill. Those now heading the opposition are fighting not for their own interests lone, but for all manufacturers.

Secretary Baker's letter in full is as follows:

War Department,
Washington, April 29. 1916.
The Speaker of the House of Representatives.

Dear Mr. Speaker: There is pending in the house of representatives a bill (H. R. 8665) introduced Jan. 11, 1916, to regulate the method of directing the work of government employes, the object of which is to prohibit at the government arsenals what are known as time studies and premium payments. Similar legislation to that which is carried in the bill was enacted on the army appropriation bill which was passed at the last session of congress, in the form of a prohibition of the payment, from funds appropriated in the act, of the salary of any person engaged in making or directing time studies or of any premium. There is, therefore, apparent, the possibility of similar legislation at the present session, either in the form of a separate act or in the form of a restrictive prohibition upon an appropriation act. I think that such legislation would be unwise. The time study referred to may be defined as a method of ascertaining by careful observation and study in connection with the timing process the most advantageous manner in which a given piece of work can be done, and also the time in which it can reasonably be expected to be done by following this best manner. The premium is an extra cash compensation which is paid to a workman for accomplishing the work in this reasonable time, or for approaching the time within certain rather liberal limits, the compensation being in addition to the regular wages of the workman, which are not disturbed, and depending in amount upon the degree to which he approaches the reasonable time which has been

Photo by Newman, Cleveland.

NEWTON D. BAKER

ascertained. The timepiece is used only in the study of a new job, for the purpose of working it out properly and for assigning the proper time for its performance. It is not held over a man for the purpose of ascertaining whether he is working industriously, and its employment is of less and less frequency as information is accumulated which makes special study unnecessary. The premium is the workman's share of the economy which is effected by the system.

This system has now been in practice in the ordnance department for something like five years. At the place at which it has been most fully put into effect, the Watertown, Mass., arsenal, it has resulted in very substantial economy of production and in a material increase of the earnings of the employes. The last monthly report from the arsenal indicates that the total amount paid in premiums during that month was $3,315.61, which was earned by 311 employes, an average of about $10.66 each. The total number of mechanics and workmen at the arsenal was 554, of which approximately 56 per cent worked during the month on premium jobs. The total pay roll of the arsenal for the month was $45,250.85, of which amount it therefore appears that slightly over 7.32 per cent was paid in premiums. The premiums are in addition to the day wages of the employes, which are regulated in accordance with those of the vicinity for work of similar character to that done at the arsenal. During the five years that the system has been in operation at the arsenal neither the day wage nor the number of employes has diminished, but the amount of work done and the average earnings have increased in an important degree.

The legislation which is being urged upon congress is advocated by organized labor, which opposed to the system intended to be prohibited for the essential reason which is embodied in the charge that it is a speeding-up system. I cannot understand this charge as having any other meaning than that the work required of the employes by the system is unduly severe. Of the truth of this charge in the practice of the system at the Watertown arsenal there is no evidence whatever, but there is a good deal of evidence the other way. There is no complaint of overwork at the arsenal, and no workman has been discharged because of failure to meet the requirements of the system. To prohibit the system of which the records show undoubted advantages both to the government and to the employes because of a charge unsupported by evidence, or even by any attempt at evidence—for there has been no effort to prove overwork at the Watertown arsenal—seems to be most unwise.

There has been no investigation at the Watertown arsenal which has resulted in a report condemnatory of the practice at that establishment. This department has endeavored to secure an investigation and report from the federal commission on industrial relations, created by the act of Aug. 23, 1912, and that commission employed a committee which did make a very thorough investigation. Neither the commission nor its committee, however, made any mention of the Watertown arsenal in its report, but both of these bodies confined themselves to a general discussion of the relations of scientific management and labor largely as a social question. The commission was not able to agree, and conflicting reports were made by groups of its membership. The report of the special investigation committee has not been made public, but the substance of it is understood to be contained in a book entitled "Scientific Management and Labor," by the chairman of the committee, which leaves the subject of scientific management in its general practice in shops which have introduced it still open to discussion. The only investigation at the Watertown arsenal of which the result has been published in a report is that which a special committee of the house of representatives made some four years ago, and as a result of which the committee recommended that there should be no legislation upon the subject. There have been expressions from the employes at the Watertown arsenal both for and against the system. There are evidences that at least some of the expressions against it have come from representatives of organized labor, but I am persuaded that this opposition proceeds from a mistaken theory; for while it is obviously true that a piecework system in which the pay of the employes is based solely on a piece price, and high-speed machinery is used to drive operatives harder than is consistent with their physical and nervous welfare, is objectionable, it is equally true, in my judgment, that the system above described as operative in the Watertown arsenal is not open to either of these objections. The government surely should not be denied the opportunity of securing efficient work from its employes without an investigation of the facts which would justify the action proposed to be taken.

All of my predecessors in the office of the secretary of war who have held that office since the introduction of the system at the Watertown arsenal have been in favor of its retention and have opposed efforts to abolish it. I have been in this office too short a time to have had an opportunity to visit the arsenal or to familiarize myself thoroughly with the details of the practice at that establishment, but I have long been interested in both aspects of the problem presented and do not feel that I am an entire stranger to the controversy merely because of the recentness of my contact with this particular application of it.

The relation between fatigue and efficiency is being widely studied, and in some of the European countries astonishing statistical demonstrations of the effect of speeding-up processes have already been obtained. There can be no question that the whole nervous and physical system of the operative is imperiled, and his strength, as a part of the national strength, decreased, if he is either urged or induced to work beyond a sound physiological maximum. On the other hand, inefficient production is bad for the operative. It is always bad for a man not to do his best, not to make the most of his opportunities and of his labor, and to produce less than he can under a system of proper inducements and compensations. It is bad for the national life, for its industrial efficiency, and for its squareness to have its component parts, whether they be operatives in an industrial plant, professional men or public officers, turning into the

Endorse Baker

The National Metal Trades Association has adopted the following resolution:

Whereas there is now pending in congress house bill 8665, known as the Tavenner bill, to regulate the method of directing the work of the government employes, the object of which is to prohibit at the government arsenals what are known as time studies and premium payments, and

Whereas this association fully agrees with the facts and request set forth by the Honorable Newton D. Baker, secretary of war, in a letter to the speaker of the house of representatives under date of April 20, 1916, therefore be it

Resolved that this association notify the committee on military affairs of its disapproval of said H. R. bill 8665, and that our members do all in their power to help the defeat of this bill and to strengthen the hands of the secretary of war.

aggregate either a product so excessive that it represents a deterioration in their physical and nervous strength, or a product so insufficient as to represent less than their honest and safe best. To strike the happy mean involved in these statements is, of course, difficult, but at the Watertown arsenal we seem to have made a fair approach to it. The wages paid to our operatives as a flat rate, irrespective of their response to the time system, is the current rate of the community for similar work, and in addition to that, premiums are offered, not large, but large enough to stimulate continuous and faithful activity. So far as I know, there is not a case on record at Watertown since the introduction of this system of a nervous breakdown or physical exhaustion due to excessive work, nor is it claimed that the operatives in that plant, protected as they are against long hours by a wise 8-hour provision, are in any sense driven or hurried beyond a fair and safe limit.

Baker Lauds Past Achievement

As I am not in any sense personally responsible for the work which has been done at the Watertown arsenal, I can be permitted to say that in my judgment it represents an achievement of which both the legislative and executive branches of the government can be justly proud. The reproach is often made that the public cannot conduct an economical and efficient industrial enterprise, but no such charge can be brought against the Watertown arsenal, and I think it would be a grave misfortune to the public service and to the employes of the government there engaged if any action were taken prejudicial to the system which is working so well without a special investigation at the arsenal itself which would make a comprehensive study of the results of the system, both in output and upon the operatives. Similar studies have been made in other places; there are a great many experts who know exactly how to make such studies, and the information presented by them could be weighed and proper value given it in determining a future policy.

Sincerely yours,
Newton D. Baker,
Secretary of War.

Act This Week on Tavenner Bill

Washington, May 2.—The house committee on labor again failed to muster a quorum last Thursday, its regular meeting day, and therefore did not take up the question of reconsidering the Tavenner bill, which proposes to eliminate scientific management from government establishments. It was suggested by one member that one more attempt be made to secure a quorum to vote on the matter of reconsidering this bill and accordingly letters were sent to all the members asking that they attend the meeting on Thursday of this week and dispose of the question. Failure of the committee to attend the meeting has been interpreted as denoting that the majority of the members are either indifferent to the fate of this important measure, or that they have made up their minds in advance to support it, and, thinking it will not be reconsidered, have disregarded the meetings. No meeting of the committee has been held since manufacturing interests, efficiency engineers and others appeared before the committee and testified in opposition to it. Apparently their testimony has been ignored entirely by those supporting the bill.

It develops, however, that opposition to the bill will be made before the committee, but it is a question as to how strong this opposition will be. Representative Edward Everetts Browne, Republican, of Wisconsin, a member of the committee, told *The Iron Trade Review* that he is opposed to it. If the committee votes against reconsidering the bill and affirms its previous action by which it ordered the bill reported favorably, Mr. Browne said that he at least expects to submit a minority report protesting against enactment of the measure into law. It is thought that others may join Mr. Browne, but it still seems improbable that the committee will reverse its former action and vote against the bill.

The report made by Secretary of War Newton D. Baker against the bill probably will be brought to the attention of the committee on Thursday and will add strength to the opposition. This combined with position of Representative Browne and possibly other members of the committee may precipitate a sharp row. Those supporting the bill indicate that they realize the possibilities of a strong fight against the measure and are showing some uneasiness over the situation.

It seems to have been clearly a mistake on the part of the house to refer the Baker report to the committee on military affairs, instead of to the committee on labor. The reason for doing this does not seem to have been inspired by an attempt to "bury" the report, but probably was due chiefly to parliamentary haste and indifference. It is a remarkable fact that some members of the labor committee did not know until a week afterwards that the Baker report had been sent to Speaker Champ Clark.

There is a feeling that the Baker report should be carefully considered before the committee acts further on the measure, and that in addition Postmaster General Albert Sidney Burleson, said to be opposed to the bill, should file a brief with the committee reciting his contentions. The postmaster general in such a contingency would probably incorporate in his brief a protest against the bill introduced by Carl C. Van Dyke, Democrat, of Minnesota, a member of the labor committee, which would abolish the efficiency system in the postoffice department. The Tavenner bill, of course, includes all government establishments.

"I am against the Tavenner bill," said Representative Browne, "and if the committee declines to reconsider it and votes for it, I probably will file a minority report. It may be that congress will think this is not an opportune time to pass the measure. The points made against the efficiency system relate solely to its abuses and not to its uses. So long as human nature is constituted as it now is, we may always expect to find some bad employers. Any system can be abused, and if the efficiency system is eliminated the practice taking its place may be expected to be subjected to abuse. There is so little efficiency in this country that we should encourage rather than penalize it."

The Tavenner bill was endorsed here last week at a meeting of the Central Labor Union in resolutions it adopted, which condemned the Taylor system.

N. P. Alifas, president of District 44, International Association of Machinists, said at the meeting that "labor organizations all over the United States are taking up this question, and congress will be expected to take some action that will stop this 'modern sweatshop system' introduced in the arsenals". It was charged that "the war department has seen fit to continue the Taylor system at its arsenals in defiance of the plain spirit of congressional action of the last congress, against the recommendations and views of four committees of congress, the commission on industrial relations and the last four conventions of the American Federation of Labor".

Business News of Nation's Capital

Interesting Points of Hearing on Inter-Mountain Cases—Position of Steel Makers—Tariff Commission Bill Indorsed

Bureau of *The Iron Trade Review*,
206 Corcoran Bldg.,
May 2, 1916.

THE iron and steel industry of the country is showing intense interest in the action to be pursued by the interstate commerce commission as the result of hearings and arguments taking place before it last week with regard to the reopening of Schedule C of the so-called intermountain cases. This schedule consists principally of iron and steel products and as it now stands, transcontinental railroads are permitted to charge a lower rate for hauling material to the Pacific coast from steel producing centers than for carrying it to intermediate points.

The order of the commission reopening the schedule was granted upon the motion of state commissions and shipping interests at intermediate points. They contended that the commission should revoke its order allowing the transcontinental lines to charge less for hauls to the Atlantic and Pacific coasts than to intermediate points, as the condition which prevailed at the time the order was entered no longer obtains because the coast-to-coast shipping lines have withdrawn from the Panama canal trade. Intermediate interests maintain that, water line competition having disappeared, the railroads should be permitted to charge higher rates to their sections than are charged to coast terminals, claiming that under present conditions they are being discriminated against in favor of coast shippers. They were supported in their contention by representatives of the American-Hawaiian Steamship Co., and the Luckenbach Steamship Co., which, before they withdrew from the canal trade, carried 90 per cent of the coastwise traffic going through that waterway. The Southern Pacific railroad was the principal carrier which opposed revocation of the commission's order, although Fred H. Wood, attorney for that line, in his argument and at the hearings represented all of the transcontinental rail carriers, but except on some special aspects of the cases, the transcontinental lines, as a general thing, apparently showed only a nominal interest in the proceeding.

N. L. Moon, of the Alan Wood Iron & Steel Co., took the stand during the hearings as a representative of steel producers situated east of the Pittsburgh district, and was questioned on direct examination by H. C. Crawford, of the Cambria Steel Co. Mr. Moon told the commission that producers east of Pittsburgh want to be given the same rate on steel articles to the Pacific coast as that applying to Pittsburgh, which was reduced to 65c per 100 pounds on April 10. Previously Pittsburgh and Atlantic seaboard steel producers got an all-rail rate of 75c, which still applies to the latter. Mr. Moon said that Pittsburgh producers are the principal competitors of eastern manufacturers for Pacific coast business, and that if the present differential of 10c per 100 pounds or $2 per ton in the rate was continued, the Pacific coast business of eastern producers would be destroyed.

F. T. Bentley, traffic manager of the Illinois Steel Co.; Wilmer M. Wood, of the United States Cast Iron Pipe & Foundry Co.; C. L. Lingo, of the Inland Steel Co., and R. P. Hearon, of the Colorado Fuel & Iron Co., spoke briefly as to conditions as they understood them and favored a continuance of the present rate situation.

"I want Schedule C and the rate from Colorado to the Pacific coast continued," said Mr. Hearon. "It has enabled us to regain our market on the coast. When water competition came in in 1908 we lost our market to the eastern steel man. It took us a long time to get the present adjustment. One shipment per month of iron and steel through the canal is enough to fix prices. That is particularly true, for instance, with regard to bar iron."

Favors the Bill

Washington, May 2.—After analyzing the Rainey non-partisan tariff commission, a special committee of the chamber of commerce of the United States, of which Daniel P. Morse, of New York, is chairman, has endorsed the measure, which is supported by the administration. This action of the special committee is taken to mean that in its opinion the bill accords with the principles for which the membership of the national chamber declared in a referendum which was carried by an overwhelming vote. Accordingly the committee is now asking the members of the national chamber to support the Rainey bill and to do what they can towards its enactment at this session of congress.

Proposed Increase

Washington, May 2.—The proposal of railroads to increase rates from 10c to 15c on bituminous coal from the Pittsburgh, Ohio and West Virginia fields to consuming points in central freight association territory, including districts where blast furnaces and steel mills are situated, came up for hearing last week before Examiner Marshall, of the interstate commerce commission. After two days, the hearing was continued until June 12.

Export Agencies

Washington, May 2.—The federal trade commission is expected to urge passage at the present session of congress of a bill which it has drafted authorizing the formation of export agencies in this country for the promotion of foreign trade. The bill has been submitted to President Wilson and is understood to have his approval, and, if it is enacted, probably will be made an amendment to the Sherman anti-trust law. The commission drafted the measure after it had made an investigation of conditions in the export business.

It is provided that every association or selling agency engaged in export trade shall file with the federal trade commission its contract of association, the location of its offices or places of business and full information relating to its membership. The commission would have power to prevent Americans engaged in export trade from using unfair methods of competition against American competitors even though the acts constituting such unfair methods are done in foreign countries.

Schwab for Profit Sharing

Says Brains Must Be Rewarded—Secretary Baker Declares There Must Be No War Brides

Charles M. Schwab, speaking at the annual dinner of the American Newspaper Publishers' Association at the Waldorf-Astoria, New York City, Thursday evening, April 27, discussed the proper relation of the government toward its industries and urged policies of effective co-operation as the best means of safeguarding the security of the nation. Mr. Schwab, in his address, followed Secretary of War Newton D. Baker, who declared a three-fold mobilization of the country is necessary for its protection, consisting first, military; second, industrial, and third, spiritual. Mr. Baker said in part:

"If the hour of trial should ever come, there must be no war stocks, war brides, no war fortunes made out of national danger. Nor must there be built up in America any interest which could even be suspected of preparing to profit by the creation of a national emergency.

"In order to make sacrifices for America, we must be sure that our stake in the country justifies it. Our institutions must be so just, our arrangements so fair that every man in this nation will realize how completely his opportunity and that of those who come after him rest upon the continuing prosperity of the nation as a whole."

"Two great questions," said Mr. Schwab, "concern the future of American industry. The first is, how shall we enlist that personal element that has done so much for American industry? All capital and industry is of little value without the brains and ability to make it a success, and those men whose brains and ability have made industry a success and who make it a success should, in my opinion, have a wider share in the profits and benefits of the industry to which they have contributed. I mean that each man who proves his ability to make any industry successful should be admitted to a proportionate share in the results of that industry.

"And now we come to the second matter. It is through understanding between the government and industry in this country that we shall progress. The government should encourage and build up industries, not destroy them. Suppose some men do get rich, suppose some wealth is misappropriated, what does that count in comparison to the advantage to the whole country from successful industries? We have heard what Secretary Baker has said about industrial preparedness, and we want to tell Mr. Baker that the industries of this country will stand shoulder to shoulder with the government—but the government should foster and stand by those industries that will work with the government. The government should listen to the industrial men who prove their loyalty. They should be called upon by the government and the government should cooperate with them in their industries.

"Thorough preparation for war lies with the industries of the country, and I want to say now for the industry that I represent that the country will find no more loyal group of men, no men who love their country more than the men in the iron and steel industry."

Mr. Schwab reviewed the development of the country's iron and steel industry and estimated that in 1916, 40,000,000 tons of steel would be produced.

Will Extend Plant

The Wheeling Steel & Iron Co., Wheeling, W. Va., has secured legal permission to vacate a portion of North street in that city for use in the extension of the present plant. The company, it is reported, is contemplating the erection of an additional blast furnace at the site.

Steel Men Send Metaphysics Glimmering

Washington, May 1. — Recently there stood in the corridor of the house office building a man who was waiting for the committee on naval affairs to convene so that he might appear before it and tell its members how to bring the European war to an end. While such a worthy task is not supposed to be any part of the business of the committee, it had promised to hear the witness, not knowing what he was going to say, but having received his pledge that he would occupy not more than five minutes of the committee's time. And, as it subsequently developed, it took him just four minutes to give an illuminating discussion of such simple treatises as those bearing on "The Relation of Sex to War", ethnology, ad infinitum.

While the witness-to-be was waiting to relieve his mind of the heavy load it carried, he engaged in conversation with a newspaper correspondent, who was also waiting for the committee to begin its hearing, which the correspondent was to "cover".

Soon a tall, erect, fine-looking, serious-minded man came by.

"Good morning," said the witness-to-be, courteously.

The tall, fine-looking man, his mind evidently preoccupied, merely nodded.

"Who is that gentleman?" inquired the witness-to-be of the correspondent.

"That gentleman," said the correspondent, "is one of the most prominent steel manufacturers in the country—Mr. Barba."

"I thought so," said the witness-to-be, sagely. "It is all a matter of metaphysics. You can see that that gentleman's environments have made his nature as hard and inflexible as the steel he makes. Metaphysics tell me that."

"Don't know anything about metaphysics," the correspondent replied, laconically.

Just then there approached jauntily a small man, his face wreathed in smiles, eyes dancing, giving the impression of one who had no cares or responsibilities, enjoying every minute of his life.

"Good morning," he said pleasantly to the witness-to-be and correspondent.

The cordial greeting was returned.

"And who is that gentleman?" asked the witness-to-be.

"That gentleman," returned the correspondent, "is also one of the most prominent steel manufacturers in the country. His name is Grace."

Mental confusion overcame the witness-to-be. The correspondent grasped the situation and smilingly inquired: "Where's your metaphysics now?"

"Really, I don't know," said the witness-to-be, as he excused himself and walked away.

Will Build Wire Mill

The Keystone Steel & Wire Co., Peoria, Ill., wire fence manufacturer, has practically completed arrangements to erect at Bartonville, a suburb, a steel wire and rod mill with equipment for a producing capacity of 300 tons daily. The estimated cost will reach $1,750,000. The purpose of the additional plant is to produce steel rods and wire for use in the manufacture of wire fences and gates, while any surplus that should be available would be sold on the market. A considerable reduction in cost of the product is expected to result from the new undertaking.

The equipment of the plant will consist of two 75-ton open hearth furnaces with charging and pouring accessories of the latest type, a 35-inch blooming mill driven by a 1,200-horsepower engine for the production of billets, and a double-strand Morgan continuous rod mill. The intention is to make use of a large proportion of scrap iron in the furnaces. With the increased facilities the company is expecting to double its present production, which is valued at more than $2,000,000 yearly.

The officers of the company are: President and general manager, B. W. Sommer; vice president, Peter Sommer; secretary and treasurer, D. L. Sommer. H. G. Moore is general sales manager.

A. Schaeffer has been made district sales manager and placed in charge of a new office just opened by the Central Steel Co., at 1511 Lytton building, Chicago.

Orders McLain Furnace

The Gas Traction Foundry Co., Minneapolis, which operates a large gray iron and brass foundry, has placed an order with David McLain, Goldsmith building, Milwaukee, for the installation of a 2-ton open hearth furnace which will have an output of five heats or 10 tons in 12 hours. The first furnace of this type built by Mr. McLain now is in operation at the plant of the Standard Crucible Steel Casting Co., Milwaukee, and since it was placed in operation in March more than 200 heats have been made without relining or repairs of any kind to the roof. At this plant four or five heats are made daily, the metal being poured into castings of varying weights from a few ounces to 1,000 pounds.

Statistics of Upper Lake Ore Docks

W. A. Clark, chief engineer of the Duluth & Iron Range railroad, has prepared the following table, showing complete details of all of the ore loading docks of the Great Lakes. The information has been revised and corrected up to May 1. The table holds a peculiar interest at this time as all of the docks shown have been prepared for handling the largest tonnage of iron ore ever forwarded before from the Lake Superior district.

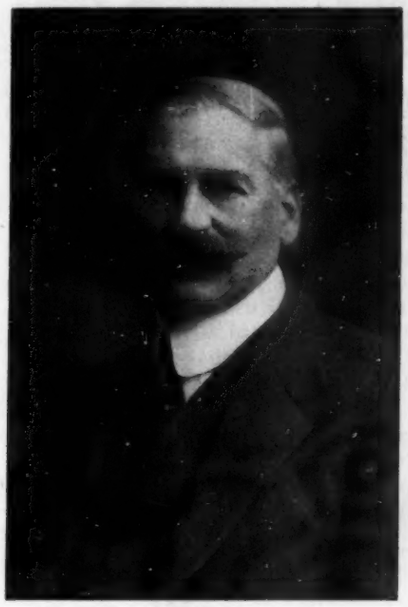
Railway—Location.	Dock No.	No. of pock-etc.	Capacity per pocket cars, tons.	Storage capacity gross tons.	Height water to center hinge hole, ft. in.	H'ght water to deck of dock, ft. in.	Width of dock outside to outside of partition posts, ft. in.	L'gth of spouts, ft. in.	Length of dock, ft. in.	Angle of pockets, deg. min.	Cubic feet per pocket to bottom of stringers.
Chicago & Northwestern Ry., Escanaba, Mich..	3	226	2 @ 50 1 @ 25 2 @ 50	28,250	31 2	52 8	37 0	27 0	1,356	45 0	1,969
Chicago & Northwestern Ry., Escanaba, Mich..	4	250	1 @ 25	31,250	36 6	59 2	37 0	30 0	1,500	45 0	2,191
Chicago & Northwestern Ry., Escanaba, Mich..	5	370	5 @ 50	92,500	37 9½	70 9	52 2	32 1½	2,200	45 0	4,142
Chicago & Northwestern Ry., Escanaba, Mich..	6	320	5 @ 50	80,000	40 0	70 0	50 2	30 0	1,920	45 0	4,114
Chicago & Northwestern Ry., Ashland, Wis....	1	290	5 @ 50	72,500	40 0	72 11	50 2	30 0 32 1½	1,740	45 0	4,100
Chicago & Northwestern Ry., Ashland, Wis....	2	278	4 @ 50	55,600	40 0	70 0	50 2	30 0 32 1½	1,668	45 0	3,915
Total		1,734		360,100							
†Duluth & Iron Range Ry., Two Harbors, Minn.	1	224	5 @ 50	56,000	39 3	74 0	51 8	34 0	1,376	48 0	4,075
Duluth & Iron Range Ry., Two Harbors, Minn.	2	...	...	.....	.. .	.. .	.. .	.. .	.....	.. .	.....
Duluth & Iron Range Ry., Two Harbors, Minn.	3	170	3 @ 50	25,500	40 0	66 0	49 0	27 0	1,054	43 32	3,006
Duluth & Iron Range Ry., Two Harbors, Minn.	4	168	3 @ 50	25,200	37 0	62 0	49 0	29 0	1,042	38 42	3,270
Duluth & Iron Range Ry., Two Harbors, Minn.	5	168	3 @ 50	25,200	39 0	66 9	49 0	30 0	1,050	43 32	3,126
†Duluth & Iron Range Ry., Two Harbors, Minn.	6	148	5 @ 50	37,000	40 0	73 0	51 3¼	34 0	920	45 0	4,192
Total		878		168,900							
Duluth, Missabe & Northern Ry., Duluth, Minn.	2	384	2 @ 50	38,400	32 0	57 6	49 0	27 9	2,336	45 0	2,368
Duluth, Missabe & Northern Ry., Duluth, Minn.	3	384	3 @ 50	57,600	40 7	67 ½	59 0	27 9	2,304	45 0	2,782
Duluth, Missabe & Northern Ry., Duluth, Minn.	4	384	4 @ 50	76,800	41 9½	72 6	57 0	30 1½	2,304	45 0	3,867
†Duluth, Missabe & Northern Ry., Duluth, Minn.	5	384	6 @ 50	115,200	40 8	80 5	56 0	36 0	2,304	47 30	4,972
Total		1,536		288,000							
Great Northern Ry., Superior, Wis.....	1	374	6 @ 50	112,200	40 0	73 0	62 8	32 4	2,244	45 0	4,972
Great Northern Ry., Superior, Wis.....	2	350	6 @ 50	105,000	40 0	73 0	62 8	32 4	2,100	45 0	4,972
Great Northern Ry., Superior, Wis.....	3	166	6 @ 50	49,800	40 0	73 0	62 8	32 4	996	45 0	4,972
†Great Northern Ry., Superior, Wis.....	4	302	6 @ 50	90,600	40 2	75 0	62 6	34 6	1,812	47 30	5,347
Total		1,192		357,600							
†Northern Pacific Ry., Superior, Wis.....	1	102	7 @ 50	35,700	40 6	80 0	57 2	34 0	684	47 30	5,600
Duluth, South Shore & Atlantic Ry., Marquette	5	200	4 @ 50 1 @ 25	45,000	40 0	70 10	51 0	32 4	1,236	45 0	3,848
†Lake Superior & Ishpeming Ry., Marquette...	2	200	5 @ 50	50,000	43 0	75 0	54 0	35 0	1,200	45 0	4,590
Minn., St. P. & S. Ste. Marie Ry., Ashland....	1	314	2 @ 50	31,400	40 0	66 2	36 0	27 0	1,908	50 45	2,435
Minn., St. P. & S. Ste. Marie Ry., Superior...	1	300	6 @ 50	90,000	42 5½	78 0	58 0	32 1½	1,800	47 0	4,775
Total		614		121,400							
Chicago, Milwaukee & St. Paul Ry., Escanaba.	1	240	3 @ 50 1 @ 25	42,000	40 2¾	66 6	52 0	120 @ 27 120 @ 29	1,500	45 0	2,900
Chicago, Milwaukee & St. Paul Ry., Escanaba.	2	240	4 @ 50	48,000	40 11½	69 2	54 0	30 4½	1,500	45 0	3,150
Total		480		90,000							
Algoma Cent. & Hud. Bay Ry., Michipicoten, Ont.	1	12	.....	.....	34 0	43 4	25 0	22 6	311 9	44 0	.....
Canadian North. & Ont. Ry., Key Harbor, Ont.	1	20	2 @ 50	2,000	41 5	61 9	28 0	30 0	240 0	37 30	2,315

†Steel and concrete.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

SIR WILLIAM BEARDMORE, the new president of the Iron and Steel Institute, will assume his duties at the meeting to be held in London Thursday and Friday of this week. The new president happily combines the qualities of the accomplished man of science and the practical manufacturer and trained man of business. He is chairman and managing director of the great industrial undertaking known as William Beard-



SIR WILLIAM BEARDMORE

more & Co., Limited. He was born at Greenwich in 1857 and received a thorough technical education at Technical College, Glasgow, and the Kensington School of Mines, London. In 1886 he purchased the business which he later developed, becoming the sole owner. He added armor and ordnance departments. The plant covers an area of 100 acres and employs between 5,000 and 6,000 men. Over 200,000 tons of steel are produced annually and are used in the making of guns, armor plate, ship plates and other products. The naval construction department contains an area of 103 acres and is one of the largest ship building and marine engineering works in the kingdom. The berths have been arranged to take vessels up to 1,000 feet in length and over 100 feet beam. Many battleships, cruisers and other vessels for the navy have been turned out.

A. E. Borie, president of the Driggs-Seabury Ordnance Co., Sharon, Pa., recently was elected a director of the Finance & Trading Corporation, New York City.

Thomas D. Rogers, metallurgist with the United Engineering & Foundry Co., Pittsburgh, at Vandergrift, Pa., has accepted a similar position with the Philadelphia Roll & Machine Co., Philadelphia.

George H. Huston until recently connected with the Root & Van Dervoort Engineering Co., East Moline, Ill., in the capacity of superintendent, has become associated with the Premier Brass & Forging Co., Cleveland, O.

Robert G. Nye, for the past five years connected, in various capacities, with the Buffalo Forge Co., of Buffalo, N. Y., has tendered his resignation as factory manager to accept a similar position with the Alberger Pump & Condenser Co., Newburgh, N. Y.

Alfred Reeke, Milwaukee, has been appointed general sales manager of the Thomas B. Jeffery Co., Kenosha, Wis., manufacturing automobiles and trucks. Mr. Reeke assumed the new duties May 1. He was president of the Reeke-Osmond Motor Car Co., Milwaukee, state agent for the Jeffery company for many years. He succeeds Edward S. Jordan, now head of the Jordan Motor Car Co., which is building a plant in Cleveland.

Edgar B. Thomas, after nine years' experience in municipal engineering design and construction, and six years in charge of the river and harbor department of the city of Cleveland, has opened offices at 1159 Leader-News building, Cleveland, to conduct a special consulting engineering practice in the investigation, design, construction, and appraisal of harbors, docks, piers, breakwaters, shore protection, dredging, drainage and municipal improvements.

Henry H. Knapp, whose resignation as assistant treasurer of Reed-Prentice Co., Worcester, Mass., took effect Jan. 1, has recently, in company with Worcester and Boston parties, consummated the formation of the Universal Export & Import Co., with offices at 49 Federal St., Boston. Mr. Knapp is the treasurer of the company, which is incorporated under Massachusetts laws to transact a general exporting and importing business and to act as manufacturers' agents. Special attention will be given to Latin-American trade, until the European war closes, when the scope of the business will be enlarged to cover all quarters of the globe. Associated with Mr. Knapp are S. S. Brill, recently special agent of the United States department of commerce, and for many years export manager for American firms in foreign countries, and

ORVILLE CAMPBELL SKINNER

others thoroughly acquainted with the proper conduct of foreign trade.

Orville Campbell Skinner has been appointed superintendent of the Standard Steel Works Co., Burnham, Pa., in charge of all the company's activities at that place. Mr. Skinner was born in Cleveland in 1872 and graduated from Case School of Applied Science with the degree of bachelor of science in June, 1894. Later he received the degree of metallurgical engineer. Positions which he has held are: Assistant chief chemist, Otis Steel Co., Cleveland, 1895; chief chemist, Corrigan, McKinney & Co., 1896; chief chemist, Shoenberger Steel Co., Pittsburgh, and superintendent open hearth department for the same company; manager open hearth department for the Tidewater Steel Co., Chester, Pa., 1899, and positions with the Standard company since 1901.

Russian Buying Comes to the Front

Domestic Sales Are of Good Volume—Pittsburgh Activity Unaffected by Labor Troubles—Railroads Place Some Business

THE machine tool market again is in the midst of a burst of activity. The past week has been featured by some further heavy buying on the part of Russian interests and the inquiry from that source continues unabated. The Russian commission in the Flatiron building, New York, has placed some of this business but most of it has come from private buyers. Among the latter is Leonid Smugge, general manager of the Michelson Works, Moscow, Russia, who is at the Hotel McAlpin, New York. The latter has been buying general munition-making equipment. Extensive orders have been placed for export to England, and some rifle-making machinery has been sold to France. Domestic sales generally are better, although there is a lack of large individual buying, excepting for the requirements of the Sun Co., Philadelphia, which are expected to be large. This company is about to build a large ship building plant at Chester, Pa., and is expected to award the necessary equipment without delay. It already has taken bids on 15 to 20 traveling cranes and on six revolving dock cranes. The American La France Fire Engine Co., New York, is expected to be in the market shortly for equipment. The railroads in the east continue to buy, although not on such a large scale as in previous weeks. The Lehigh Valley railroad has distributed some important business, and the Union Pacific has placed additional orders.

The following eastern concerns are about to expand their capacity: Bridgeport Metal Goods Co., Bridgeport, Conn.; Tafnir Bearing Co., New Britain, Conn.; Pierce-Arrow Motor Car Co., Buffalo; Syracuse Malleable Iron Works, Syracuse, N. Y.; Waclark Wire Co., Bayway, N. J.; Worcester Lathe Co., Worcester, Mass.; Adams Needle Co., Franklin, N. H.; Electric Storage Battery Co., Philadelphia; Midvale Steel & Ordance Co., Philadelphia; Kerr Turbine Co., Wellsville, N. Y.; Excelsior Needle Co., Chicopee, Mass., and the Syracuse Chilled Die & Casting Co., Syracuse, N. Y.

Strike Fails to Dull Pittsburgh Market

LABOR conditions are tending to minimize activity in the Pittsburgh machine tool market. More than 75 owners of foundries and machine shops in the immediate Pittsburgh district, after receiving demands from machinists for an 8-hour day, last week organized the Pittsburgh Employers' Association which will oppose any radical change in prevailing working-day schedules. A similar organization has been perfected in the Mahoning valley of eastern Ohio. Shops of the Westinghouse Electric & Mfg. Co., East Pittsburgh; the Union Switch & Signal Co., Swissvale; the R. D. Nuttall Co., Pittsburgh, and the Pittsburgh Meter Co., East Pittsburgh, all controled by Westinghouse interests, are idle as a result of strikes. Precautionary measures are being taken by almost every manufacturer in western Pennsylvania to prevent a general walkout of machinists, scheduled to take place this week.

The erection of rolling mills and the extensions to plants in this and adjoining districts have contributed additional inquiries for a diversified line of mill and machine shop equipment. The American Bridge Co. and the Fort Pitt Bridge Co., both of which are furnishing fabricated steel for industrial undertakings, have entered the market for several shears and punches, and other fabricators are negotiating for punching and shearing machinery. The Virginia Steel Corporation, which will build an open-hearth steel plant at Hopewell, Va., under the direction of the W. R. Miller Co., engineer, Pittsburgh, will soon purchase equipment. The Donner Steel Co., Buffalo, and the Brier Hill Steel Co., Youngstown, have completed plans for plant extensions.

Chicago Market Comes to Life

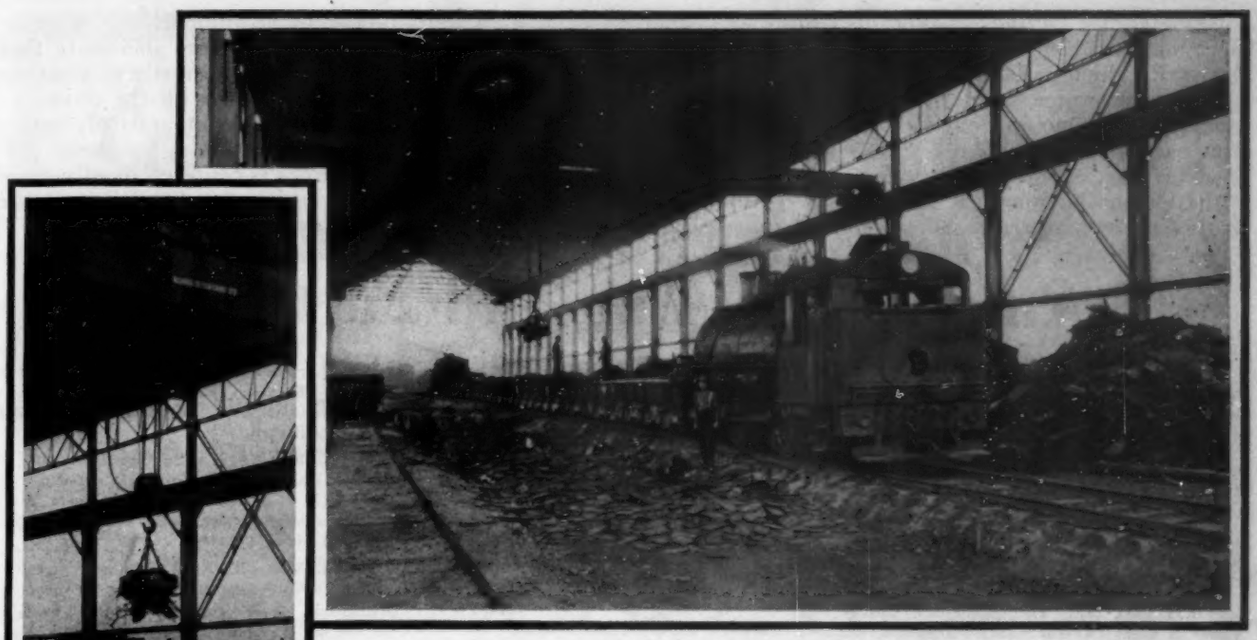
AFTER a lull in the Chicago machine tool market, which was noted a few weeks ago, inquiry has returned and both domestic and export business is excellent. Users of machine tools in practically every line of manufacture seem to be in need of further equipment and most inquiries are closed readily if the machines are satisfactory. The large lists issued by railroads, as set forth in *The Iron Trade Review* during recent weeks, are being figured and in addition sales are being made to steel companies who are increasing their plants. Sales to munition manufacturers have been made. A Russian buyer is now in the Chicago market and is said to be seeking 400 lathes. Canadian buyers, who have been absent for some time, are inquiring again, seeking 24 to 36-inch lathes for turning 9-inch projectiles. Some isolated instances of increased prices have been met, but for standard material quotations are steady. In a few instances, builders are able to deliver sooner than they had promised and in one case machines promised for December will be delivered in July.

Cleveland Market Inactive

THERE is little activity in the Cleveland machine tool market. Miscellaneous lots of tools are turned over frequently but there has not been an instance during the last week of any one individual buyer taking any considerable number of tools. The second-hand market appears to be improving. Inquiries for this kind of equipment are coming out encouragingly after the lull which affected the second-hand market for a few weeks. To what extent the threatened strike of machinists in nearby districts will affect Cleveland is not known at this time. Generally local tool builders are optimistic over the labor situation as it is found in Cleveland. One local builder has announced that his men are entirely satisfied and does not believe that there is any unrest whatsoever in the ranks of the skilled mechanics.

Labor Occupies Limelight in Cincinnati

THE principal item of interest in the Cincinnati machine tool market, is the threatened strike of union machinists. To what extent any such development will affect machine tool shops in the Cincinnati district is a matter of conjecture. Employers state that since this contemplated move by the union is only a continuation of the unsuccessful strike that



Loading Scrap into Charging Boxes

Scrap Always Selected for Quality

IN MANY plants, scrap is all that its name implies—*any* refuse metal that will melt is accepted.

But the quality that we put into Agathon Steel requires that the scrap be just as carefully selected as the pig iron—it must pass rigid specifications covering chemical and physical requirements.

AGATHON STEELS

will serve your purposes BEST

"AGATHON" Chrome Nickel	"AGATHON" Special Analyses
"AGATHON" Chrome Steel	"AGATHON" Vanadium
"AGATHON" Chrome Vanadium	"AGATHON" Silico-Manganese
"AGATHON" Nickel Steel	"AGATHON" High Carbon

Phidias, one of the greatest of Grecian sculptors realized that the quality of his finished product depended greatly upon the quality of the material he used. Upon the completion of each work of art it was his delight to have the entire nation rise up and exclaim *"AGATHON"! Highest Quality!*

Therefore he was severely critical in his selection of rough stone.

We produce *"Agathon"* quality by being severely critical of *our* raw materials.

AGATHON STEELS

TRADE MARK

THE CENTRAL STEEL COMPANY

MASSILLON, OHIO

Detroit Office: 326-27-28 Ford Bldg., F. Walter Guibert, District Representative
Cleveland Office: Hickox Bldg. The Hamill-Hickox Co., District Representative
Chicago Office: Room 1511-12 Lytton Bldg., 14 East Jackson Blvd., Mr. A. Schaeffer, District Representative

originated last October, no serious results will occur. Demands made by the union are the same as those last fall, which call for a 48-hour week, with no reduction in wages from the present 52-hour week, and also for time and one-half for all overtime with the exception of Sundays and holidays, for which double time is asked. It is certain that the strike situation in Cincinnati at present is well under control of the employers, as all machine shops are operating at capacity, and find no difficulty in securing skilled labor. Machine tool builders also state that their present forces are composed mostly of younger workmen who have no affiliation with the union.

The machine tool market is comparatively quiet. Very little foreign business is being booked. Inquiry from domestic sources is centered mostly upon lathes, drills, milling machines, and small portable grinders and drills.

Among New England Factories

AUBURN, ME.—The Lunn & Sweet Shoe Co. will build a brick, mill construction, 4-story, 82 x 148-foqt addition to its factory.

LEWISTON, ME.—The city and chamber of commerce will build an auditorium to cost $100,000, two sites being under consideration.

MACHIAS, ME.—The American Co. has been incorporated to engage in a machine tool business; $400,000 capital stock; by F. L. Clark, I. M. Bangs, and A. D. McFaul.

PORTLAND, ME.—The Cumberland County Power & Light Co. has awarded a contract to the Blaw Steel Co., Pittsburgh, for a transmission line 16 miles long to connect with its power house in Great Falls, Hiram, Me.

SOUTH BREWER, ME. — The Eastern Chemical Co. will erect an electrolytic bleaching plant at a cost of $150,000.

WESTFIELD, ME.—The Westfield Electric Co. has been incorporated; $10,000 capital stock; by Royal J. Colbath, Aubrey C. Frost, and Horace A. Anderson, Mars Hill.

BERLIN, N. H.—The International Paper Co. plans to build a paper mill to cost $1,500,000, to be equipped with four pattern paper machines, hydraulic lifts, etc.

MANCHESTER, N. H.—McLean & Taylor will build a brick, 3-story, 40 x 80-foot cold storage plant on Elm street.

MANCHESTER, N. H. — The New England Telephone & Telegraph Co. will build a brick, 4-story building at Vine and Concord streets.

MILFORD, N. H.—The Milford Mfg. Co., will build a brick addition to its weave shed for 300 machines and a 50-foot addition to the main mill of the Morse & Kaley property which it has bought from the American Thread Co.

BRATTLEBORO, VT.—Arthur F. Roberts has bought C. E. Skerry's controlling interest in the National Automatic Machine Co., and will remove it to the vacant Vinton Machine shop on Elm street, which it has purchased. The company is working largely on subcontracts for munitions.

BOSTON.—The Gillette Safety Razor Co. will build a reinforced concrete 6-story and basement, 75 x 75-foot addition to its factory on West Second street, South Boston.

BOSTON.—The Monarch Mfg. Co. has been incorporated to build machinery; $50,000 capital stock; by Frank P. Robinson, S. Franklin Sutherland and Henry W. Sprague.

BOSTON.—The Turner Construction Co., New York, has opened an office at 45 Milk street as its New England branch, which will be in charge of W. R. Sides, district contract manager, and A. C. Tozzer, general superintendent.

BROCKTON, MASS.—Plans will be ready to figure about May 15 for a brick, 5-story business block for the Kennedy Clothing Co. at 134 Main street.

CAMBRIDGE, MASS. — The Cambridge Paper Box Co. has awarded a contract for a brick, mill construction, 3-story and basement, 57 x 81-foot addition to its factory at 196 Broadway, to cost $40,000.

FALL RIVER, MASS. — The American Thread Co. will build a concrete, 3-story bleach and dye house as an addition to its plant which, with equipment, will cost $300,000.

GREENFELD, MASS. — The Keystone Stoker Co. will build a brick, 1-story, 60 x 120-foot machine shop.

SOUTHBRIDGE, MASS.—The Southbridge Printing Co. will build a concrete, 1-story, 40 x 150-foot storehouse.

SOUTHBRIDGE, MASS. — The Dupaul, Young Optical Co. will build a brick, 2-story, 40 x 65-foot factory on Dupaul street for the Dupal, Lockhart Optical Co.

SPRINGFIELD, MASS.—The Dazzle Dimmer Co. has been incorporated to build all kinds of machinery; $10,000 capital stock; by Herbert H. Audet, Denis E. O'Neil and Edith B. Dixon.

WEST SOMERVILLE, MASS.—The New England Blacking Co., Boston, will build a brick, 1-story, 80 x 130-foot factory building on the boulevard.

WORCESTER, MASS.—The Denholm & McKay Co., will build a brick addition connecting at the rear with its present store on Main street which, with other alterations will cost about $100,000.

LONSDALE, R. I.—A reinforced concrete bridge to cost $40,000 will be built over the Blackstone river to replace the structure known as Whipple's bridge, connecting Cumberland and Lincoln.

PROVIDENCE, R. I.—The Rhode Island Co. will build a trolley freight house on Eddy street to cost $75,000.

PROVIDENCE, R. I.—The General Plate Co. has been incorporated; $100,000 capital stock; by Frank L. Hinckley, Harold P. Salisbury and Chauncey E. Wheeler, Cranston.

BRIDGEPORT, CONN. — The Remington Arms-Union Metallic Cartridge Co. will build three brick 64 x 125-foot dormitories on Palisade avenue.

BRIDGEPORT, CONN.—The Modern Construction Co. has been incorporated; $5,000 capital stock; by Isaac O. Farber, Maurice Abelman and William Eberling Jr.

BRIDGEPORT, CONN.—Plans will be ready to figure about May 15 for a concrete and steel municipal ice plant and cold storage warehouse to cost $200,000 on Housatonic avenue.

HARTFORD, CONN.—The W. E. House Electric Co. has been organized; $7,100 capital stock; by Wilfred E. House, Harold F. House, Edward M. Young, C. B. Connors.

MERIDEN, CONN.—The Meriden Rolling Mills Co. has been organized; $1,600 capital stock; by A. H. Armstrong, David L. Gluck, New York; Mark Wise, Newark, N. J.

NEW HAVEN, CONN.—The New England Machinery Co. has increased its capital stock from $25,000 to $100,000.

NEW HAVEN, CONN.—Fire damaged the factory of the Rattan Mfg. Co., causing a loss close to $100,000.

Along the Middle Atlantic Seaboard

NEW YORK.—The Keystone Watch Co., Riverside, N. J., is in the market for equipment for making time fuses.

NEW YORK.—The American Steel Foundries is in the market for lathes and other equipment for making 9.2-inch shells.

NEW YORK.—The Sanitation Corporation, a subsidiary of T. A. Gillespie & Co., 30 Church street, has taken a lease on the plant at Twelfth and Monmouth streets, Jersey City, N. J., formerly occupied by the Statndard Gas & Power Corporation. The plant comprises about 47,000 square feet of floor space and the lease is for three years, with an option to purchase.

SCHENECTADY, N. Y.—The American Locomotive Co. is taking bids on a quantity of equipment for a new cylinder and forging shop to be erected in Schenectady.

ST. JOHNSVILLE, N. Y.—A company is being organized to take over the manufacture of knitting-mill machinery, now carried on by the H. P. Snyder Mfg. Co., Little Falls, N. Y. Chas. Johnson, salesman for the Snyder company, will head the new concern.

CAMDEN, N. J.—Irwin & Leighton, Philadelphia, have been awarded a contract for the erection of cabinet plant for the Victor Talking Machine Co. The structure will cost $500,000.

EAST ORANGE, N. J. — The Aeromarine Plane & Motor Co. has been incorporated to build aeroplanes, balloons and other craft; $10,000 capital stock; by M. L. Weiland, New York, Arthur H. Slack and B. M. Fisher, Brooklyn.

ELIZABETH, N. J.—The Barrett Mfg. Co. will erect a storehouse on South Front street.

ELIZABETH, N. J.—The United Chemical Co., New York, will erect a plant at Elizabeth for the manufacture of aniline dyes.

ELIZABETH, N. J.—The Waclark Wire Co. contemplates the erection of five buildings to its plant at Bayway, according to Superintendent Philip Foster.

ELIZABETH, N. J.—The Elizabeth Auto Body Mfg. Co. will erect a plant 100 x 100

Crawford Ore from the Dean-Itasca Mine on the Mesabi Range

The ore is non-bessemer, of good coarse structure. Dean-Itasca mine shipments for 1915 were 486,374 tons, mostly since August 1. For 1916 they will be considerably greater.

A complete analysis of Crawford Ore from Dean-Itasca Mine in natural state and dried at 212° Fahr.

	Dried 212°	Natural
Iron	58.35	50.2451
Phosphorus	.065	.05597
Silica	6.03	5.1924
Manganese	1.00	.8611
Alumina	3.40	2.9277
Lime	.16	.1377
Magnesia	.12	.1033
Sulphur	.031	.0266
Volatile Matter	5.74	4.9427
Moisture	13.89	

Crawford Ore Guarantee for 1916, 51.50 Per Cent Iron, Natural

The output of this mine during 1916, together with our five other mines, gives us an unusually large tonnage.

We are now taking contracts for this ore and will be glad to figure on your requirements for the coming season.

THE TOD-STAMBAUGH COMPANY

Perry-Payne Building

CLEVELAND :: :: :: :: OHIO

feet on South Spring street and an engine room 40 x 40 feet.

HALEDON, N. J.—The Mackey-Wood Aniline Color Co. has been incorporated to manufacture dyes; $60,000 capital stock; by James C. Mackey, C. Hamilton and K. Deering, Paterson.

HOBOKEN, N. J. — The Cavanaugh Construction Co. has been incorporated to build docks, etc.; $20,000 capital stock; by Theodore Cavanaugh, Weehawken; Henry Sogweiring; Hoboken, and Patrick J. Curtin, Guttenburg.

JERSEY CITY, N. J.—The Eureka Electric Sign Co. has been incorporated to manufacture electric signs; $100,000 capital stock; by Charles J. Gormley, John H. Patterson and Benjamin E. Gordon.

JERSEY CITY, N. J.—The Vincent-Gilson Engineering Co. has been incorporated to deal in mechanical devices; $25,000 capital stock; by C. R. Vincent, Plainfield, H. W. Gilson, Gilson, H. C. Gilson, Jersey City.

LINDEN, N. J.—The Ammo-Phos Chemical corporation has secured a permit for the erection of a sulphuric acid plant to cost $71,000. The company intends to remove its entire plant to Linden from New York.

MILLVILLE, N. J.—The International Development Co. has been incorporated to do a general contracting business; $250,000 capital stock; by Henry K. Mulford, Ralston C. Ware, Wayne, Pa.; Alonzo R. Moore and Paul O. Fredrich, Millville.

NEWARK, N. J.—Schnefel Bros. will build a 2-story addition to plant 46 x 50 feet to cost $13,000.

NEWARK, N. J.—The Radel Leather Mfg. Co. will erect a 2-story brick addition on Hamburg place.

NEWARK, N. J.—The Storm Mfg. Co. will let a contract for the erection of a brick freight elevator on Ogden street.

NEWARK, N. J.—Berkowitz, Goldsmith & Spiegel have let a contract for the erection of plant 70 x 100 feet, to cost $25,000.

NEWARK, N. J.—The Ivorine Co. has contracted for erection of a 2-story 25 x 75-foot addition to its plant at 267 Broome street.

NEWARK, N. J.—Marden, Orth & Hastings Co. has let a contract for two additional buildings 80 x 100 and 30 x 70 feet, respectively, on Avenue R.

NEWARK, N. J. — Thomas Preston will erect a 2-story factory building 60 x 150 feet to cost $9,000. William J. Fitzsimmons will prepare plans.

NEWARK, N. J.—The Dayton Tire Co. of New Jersey, has been incorporated to manufacture automobile tires and accessories; $10,000 capital stock; by Nathan Schwartz, Belleville; Fred D. Rausler and I. G. Farmer, Newark.

NEW BRUNSWICK, N. J.—The Public Service Corporation will build a car barn on Sanford street.

PERTH AMBOY, N. J.—The Raritan Copper works has let a contract for a 1-story factory building on Elm street 20 x 54 feet, to cost $4,000.

PERTH AMBOY, N. J.—The Standard Underground Cable Co. has let a contract for a 1-story, brick factory building, 48 x 99 feet, to cost $10,000, and a 1-story brick factory building 22 x 210 feet to cost $8,000.

PERTH AMBOY, N. J.—The Pe Ambo Chemical Co. has been incorporated to manufacture dyestuffs; $100,000 capital stock; by John Buchner, Walter G. Quackenbush and George W. Eggert, of Perth Amboy.

PLAINFIELD, N. J.—The Crescent Color & Chemical works has been incorporated to manufacture chemicals; $100,000 capital stock; by S. A. Blair, Port Richmond, S. I.; Jerome Alexander and Walter Alexander, N. Y.

BROWNSVILLE, PA. — The Monongahela railroad plans to rebuild the roundhouse and machine shops, recently damaged by fire, causing a loss of $100,000. D. K. Orr, Brownsville, is the chief engineer.

CARLISLE, PA.—The Frog & Switch Mfg. Co. has begun the erection of a 60 x 120-foot addition.

CONNELLSVILLE, PA.—Pennsylvania railroad plans to build a freight warehouse, to cost about $40,000. Alexander C. Shand, Broad street, Philadelphia, is chief engineer.

ERIE, PA.—The Erie & Western Transportation Co. plans to erect a reinforced concrete grain elevator, to cost about $350,000. W. W. Farley is manager of the company.

FRANKLIN, PA.—The Franklin Railway Supply Co. has let a contract for the erection of a 2-story, 90 x 150-foot factory addition.

GREENSBURG, PA. — The Westmoreland National bank plans to build a 7-story, 28 x 100 feet, office and bank building, to cost about $75,000. Plans are being prepared by E. E. Bailey Co., architects, Keenan building, Pittsburgh.

HENSHEYTOWN, PA.—The commissioners of Blair county have received a permit to construct a reinforced concrete arch bridge across Little Juniata river.

JOHNSTOWN, PA.—The state water supply commission, Harrisburg, has been submitted plans for a 2-span reinforced concrete arch bridge, to be constructed across Stony creek at Central avenue, connecting Eighth ward with Moxam, and to replace present steel bridge. The new structure will cost about $62,000. J. R. Crissey is city engineer.

LEBANON, PA.—The Lebanon Boiler Works is erecting a 50 x 225-foot addition.

McKEESPORT, PA.—H. Rushton, 201 Lincoln avenue, Pittsburgh, and T. J. Lewis, McKeesport, are reported to be interested in the erection of a public market, at Sinclair and Ringold streets, to cost $100,000.

MEADVILLE, PA.—The Bronze Metal Co. plans an addition, to cost about $17,000.

NEW CASTLE, PA. — T. A. Gilkey, engineer, is preparing plans for a bridge, to replace South Mill street bridge, to cost about $45,000.

NEW CASTLE, PA.—The Erie Railroad Co. plans to construct a bridge across Neshannock creek. R. S. Parsons, New York City, is chief engineer.

OIL CITY, PA.—R. H. Steber plans to build a 2-story, 30 x 70-foot factory, to cost about $20,000. The Brockway, McCeil Co., Warren, is the architect.

PITTSBURGH.—The J. S. McCormick Co. is in the market for several furnaces for melting brass.

PITTSBURGH.—J. B. Hurron Jr., South Linden avenue, will build a 5-story, 120 x 192-foot warehouse.

PITTSBURGH. — The People's Engine Products Co., recently incorporated in Dover, Del., by several Pittsburgh men, plans to build a plant in the Ohio valley near Pittsburgh.

PITTSBURGH.—W. B. Bennett, 742 Negley avenue, has been awarded a contract for erecting a 3-story and basement loft building at Ellsworth and Center avenues, East Liberty, to cost $30,000.

PITTSBURGH.—The Allegheny county commissioners recently have received permits from the state water supply commission to construct the following bridges: A highway bridge across Lake run in Patton township; a highway bridge across Little Saw Mill run in Union township; a highway bridge across Spring Garden run, between Spring Garden borough and Reserve township; a highway bridge across Blue run, in Indiana township.

READING, PA. — The Brown Engineering Co. has let a contract for the erection of a new shop building at 123 North Third street.

SOUTH BROWNSVILLE, PA.—The Monongahela railroad has let a contract for the erection of a round house at South Brownsville to cost about $40,000.

BALTIMORE. — Linde Air Products Co., with principal offices in New York City, is negotiating for a site in Baltimore on which it will erect a plant for the manufacture of oxygen.

CONGRESS HEIGHTS, D. C.—The Chemical Products Co. has let a contract for the erection of a 1-story factory to cost $24,000.

Activities in the Central States

HUNTINGTON, W. VA.—Z. T. Vinson, Donald Clark and others are incorporators of the Kentucky By-Products Coal Co., which will develop 3,000 acres of coal land in Pike county, Ky.

CLINTON, IND.—The Clinton Switch Co. has been incorporated with an authorized capital of $10,000 to manufacture switches and railway supplies. Directors are Howard Hughes, Arthur Ferguson and Harry L. Lowe.

CONNERSVILLE, IND.—The Hoosier Castings Co. has increased its capital stock from $35,000 to $100,000.

ELWOOD, IND.—The Elwood Foundry Co. has been incorporated to operate the plant of the Elwood Iron Works, which will be enlarged and equipment added. M. H. Pilkington, of Elwood, is in charge.

INDIANAPOLIS.—The Champion Rivet Co., an Ohio corporation, has qualified to transact business in Indiana, $33,000 of its capital being represented in this state, with C. C. Sheldon, of East Chicago, Ind., as agent.

INDIANAPOLIS. — The Federal Pattern Works has been incorporated with an authorized capital of $10,000 to manufacture wood and metal patterns. Stockholders are Thomas A. Lavelle, Frank D. Henzie and Thomas J. Jones.

KOKOMO, IND.—The Superior Machine Tool Co. has filed preliminary articles of dissolution.

MUNCIE, IND.—The Hall Mfg. Co. has been incorporated to manufacture electrical equipment and metal specialties. The plant of the Muncie Enameling Works has been taken over as its equipment is sufficient for all needs.

NEW ALBANY, IND.—L. M. Robinson & Co. have been incorporated with an authorized capital of $10,000 to manufacture glue testing machinery with L. M. Robsin, J. M. McManus and C. R. Turner as directors.

PRINCETON, IND.—Commissioners of Gilson county, N. T. Roberts, auditor, will ask bids about May 15 for eight steel and reinforced concrete bridges, 18 to 45 feet long.

BELLVILLE, ILL. — The Roesch-Kohl

Announcement

Your Opportunity for Immediate Deliveries of

500 Tons of Electric Steel Ingots

Per Month

300 Tons of Electric Steel Castings

Per Month, or

Alloy STEELS, CASTINGS and INGOTS, made to specifications

The output of our

New Electric Steel Plant

which is the outgrowth of our crucible steel casting business has not yet been contracted for and this is your opportunity to cover your immediate requirements. Our new, three-ton

Heroult Electric Furnace

has just been placed in operation and we are prepared to handle your requirements for

Ingots or Annealed Steel Castings

Our equipment is up-to-date and of the best. We have a trained organization with many years' experience in the production of high grade crucible steel castings. Our motto is

Highest Quality

Racine Steel Castings Co.

RACINE, WIS.

Owned and operated by the

Belle City Malleable Iron Co., Racine, Wis.

Enamel Range Co. has been incorporated; $15,000 capital stock; by Joseph P. Roesch, Arthur A. Roesch and William A. Rusick.

CHICAGO.—A. M. Harroun, 5501 Cornell avenue, is taking bids for a 1-story machine shop, 100 x 120 feet, to cost $20,000.

CHICAGO.—The Goode Machine Co. has been incorporated; $30,000 capital stock; by George M. Rawley, Stephen C. Knight and Orrin P. Goode, 35 North Dearborn street.

CHICAGO. — The Chicago Bearing Metal Co., Forty-third and Western avenue, will build an addition 50 x 150 feet. G. O. Garnsey, architect, 211 South Dearborn street, is taking bids.

CHICAGO. — The Lawrence Mfg. Co., 9 South Clinton street, is erecting a factory, seven stories, 42 x 130 feet, to cost $75,000. The concern manufactures metal gasoline lamps.

JACKSON, MICH.—The Sparks-Withington Co., maker of pressed metal and roller bearings, is building an addition and inquiring for presses.

JUNEAU, WIS.—The American Milk Co., Chicago, has purchased the plant of the Juno Motor Truck Co., Juneau, Wis., and will rebuild and equip it.

MADISON, WIS.—The state railroad commission has ordered the Chicago & North-Western railroad to eliminate grades at practically every important crossing within the limits of Kenosha. The work will cost $1,600,000 and is to be undertaken at once.

MADISON, WIS. — Application has been filed with the railroad commission of Wisconsin for a certificate of public convenience and necessity to enable the Green Bay & Eastern railroad to build a railroad from Green Bay, Wis., to Sheboygan, about 70 miles, with a later extension from Manitowoc to Sturgeon Bay. T. E. Burke, Green Bay, is attorney and headquarters are at Manitowoc. The project has been previously noted.

MILWAUKEE. — The National Weighing Apparatus Co., located at 917 Third street, has leased the former plant of the Milwaukee Separator Co., 267 Sixth street, and is now operating at that place. John L. Malenscheck is secretary.

MILWAUKEE.—The automatic plant of the Harley-Davidson Motor Co., Milwaukee, at 160 Clinton street, is being remodeled and fireproofed. The factory is owned by the Alonzo Pawling estate and for the last five years it has been occupied by the Harley-Davidson company.

MILWAUKEE. — The West Side Sheet Metal & Furnace Works is the name of a sheet metalworking concern organized by J. Scholtz and Nathan Yampol, with shops and offices at 2451 Walnut street. The company will do a general sheet metal business as well as manufacture fireproof doors, automobile parts, etc.

MILWAUKEE.—The Foster Construction Co., 534 Caswell block, Milwaukee, which has been awarded the supervising contract on the construction of the $600,000 Milwaukee Athletic club building, Milwaukee, will take estimates shortly for material, including 250 tons of reinforcing steel. As previously noted, the contract for fabricating and erecting 2,000 tons of structural shapes has been awarded to the Worden-Allen Co., Milwaukee. Armand D. Koch, 1045 Wells building, is architect.

MILWAUKEE.—The Federal Rubber Mfg. Co., Milwaukee, which recently passed into the control of the Fisk interests, Chicopee Falls, Mass., has announced plans for greatly extending the capacity of the plant, which was doubled in size a year ago. The general contract has been awarded to the Fred T. Ley Co., Springfield, Mass., for the construction of the following buildings: Reinforced concrete storehouse and shipping building, 106 x 113 feet, manufacturing building, 116 x 200 feet, steel frame and brick walls, one story and basement, with foundations for seven additional stories; manufacturing building, 112 x 235 feet, steel and brick, seven stories. Work will start shortly. B. H. Pratt is general manager.

OSHKOSH, WIS.—The Larson Construction Co., Oshkosh, has been awarded a general contract for the erection of the structure for the $100,000 filtration plant of the municipal waterworks system. The steel work has been sublet to the Milwaukee Bridge Co., Milwaukee.

RACINE, WIS.—The Gorton Fence Co. has been organized by George Gorton to engage in the manufacture of steel and wire fencing. The capital stock is $50,000. A. R. Janecky is associated with Mr. Gorton.

SAUKVILLE, WIS.—The Ozaukee Heater Co. has been organized by local capital and will erect a factory for the manufacture of oil burners and stoves. The building will be 40 x 125 feet and ready about May 20.

WAUKESHA, WIS.—In addition to manufacturing drills, seeders and other farm implements, the I. B. Rowell Co., Waukesha, which recently increased its capital stock from $100,000 to $200,000, has taken two contracts for manufacturing specialties. One order calls for 60,000 automobile self-starters, and the other a road surfacing machine, designed by W. S. Bunker and to be marketed by W. H. Hardy Jr. and R. W. Crary.

CHILLICOTHE, MO.—The Chillicothe Gun Mfg. Co. is building a plant at Chillicothe.

ST. LOUIS.—The Usona Mfg. Co. has been incorporated to manufacture articles of iron and other metals; $15,000; Fred C. Long, Herman Branckmann and Isaac Graham.

MINNEAPOLIS.—Northrup King & Co., 25 Hennipin avenue, C. C. Massie, president, are planning to build a new plant, costing about $300,000.

In the South and Around the Gulf

BRISTOL, TENN. — The King-Lockwood Overall Co. will build a $10,000 manufacturing plant at Bristol. C. B. Kearfott, Bristol, is the architect.

CHATTANOOGA, TENN.—A $35,000 fireproof warehouse for cotton with equipment is projected by Charles A. Leyerly, president of the First National bank, and others.

CHATTANOOGA, TENN. — Complete reconstruction of its telephone system, at an estimated cost of $850,000, is projected by the Cumberland Telephone & Telegraph Co.

CLARKSVILLE, TENN.—E. L. Hinson, J. P. Dunlop, John Ward and others have incorporated the E. L. Hinson Co. with $13,500 capital stock and will manufacture mill supplies.

HARRIMAN, TENN.—A corps of engineers of the Southern railroad has been surveying for a proposed union station and terminals at Harriman.

KNOXVILLE, TENN.—A 10-story hotel is to be built at Knoxville by a company of which S. B. Iuttrell is president and Howard Cornich secretary.

LOUDON, TENN.—The Loudon Hosiery Mills have plans for a 3-story addition to the plant at an estimated cost of $25,000.

ROCKWOOD, TENN.—Extensive improvements in the local plant of the Roane Iron Co. are reported to be considered by the company. Col. L. D. Tyson, Knoxville, is vice president of the company. It is stated that the company will blow in the second stack of its furnace.

STRAW PLAINS, TENN.—The Campbell & Deane Co. is in the market for a No. 3 gyratory crusher and Sturtevant pulverizer.

BOWLING GREEN, KY.—Frank L. Kister Jr., is equipping a box manufacturing plant at Tenth and Stubbins streets. The plant machinery will be electrically driven.

HAZARD, KY.—Additional machinery will be added to the plant by the Hazard Lumber & Supply Co.

LEXINGTON, KY.—The Kentucky Traction & Terminal Co., F. W. Bacon, vice president and general manager, will add a 500-horsepower boiler to the power plant. Improvements to cost $40,000 are projected.

LOUISVILLE, KY.—Articles of incorporation have been filed by the Lion Universal Mfg. Co., with $20,000 capital, to manufacture mechanical and electrical devices, novelties, etc. The incorporators include Harry J. Wolff, Louisville, and F. A. Lang, Jeffersonville, Ind.

LOUISVILLE, KY.—The Louisville Girth & Blanket Co., Story & Frankfort avenues, Louisville, has amended its charter, changing its name to the Semple Mfg. Co., and increasing the capital from $30,000 to $50,000. Additions to the plant are projected and extensive machinery purchases are contemplated.

LOUISVILLE, KY.—A plant in which to manufacture a slot machine attachment for standard meters is projected by the Electric Prepay Meter Co., which has been incorporated in Louisville with $50,000 authorized capital. Incorporators are B. D. and H. R. Abell and J. D. Sheridan, with temporary offices at 814 Starks building.

MIDDLESBORO, KY. — A cement manufacturing plant, to be established at Cumberland Gap, is projected by local business men. Frank Bentner, of Kansas City, Mo., is interested.

OWENSBORO, KY. — The International Ditching & Farm Machinery Co. has increased its capital from $50,000 to $200,000. Charles A. Rogers, W. R. Williams and J. C. Bunch are interested.

PROVIDENCE, KY.—A municipal electric plant will be installed shortly, two 120-horsepower engines and two 75-kilowatt generators having been delivered. R. M. Nance of the board of public works is in charge of the improvements.

DALLAS, TEX.—Bonds have been voted for a $500,000 electric light plant.

EL PASO.—The manufacturing committee of the chamber of commerce is negotiating with the Denver Bridge & Iron Works, Denver, Colo., for the latter to build a foundry at El Paso.

VICTORIA, TEX.—The city of Victoria has engaged an engineer to prepare plans and estimate the cost of an electric light plant.

HOBART, OKLA. — The Armstrong Steel Separator Co. has been incorporated to manufacture separators; $12,000 capital stock; by Cudellas Armstrong, John D. Appleby and F. H. Miller.

Pig Iron Warrants

You can keep Tons and Tons of Pig Iron in your Safe---

Pig Iron Prices are steadily increasing. The longer you delay buying, the more you will have to pay. And this is not the **only** cause for alarm—what is **most** to be feared is the coming shortage.

Facts prove that the increased demands for steel are far outdistancing the increased blast furnace capacity for producing pig iron.

Pretty soon somebody is going to be sweating for pig iron. **Will it be you?** Why don't you keep a big supply of pig iron in your office safe? **Pig Iron Warrants** we mean. These **Pig Iron Warrants will protect you absolutely from shortages—**

because the tons of pig iron represented by the warrants in your safe, will be held for you indefinitely, subject to your orders, no matter how greatly someone else may wish them.

Pig Iron Warrants will protect you absolutely from increased prices—

because you buy them cheaper even than open market prices—and you are insured against any advance in the market.

Let us take this proposition up with you thoroughly.

A delay will mean higher production costs.

American Pig Iron Storage Warrant Co.

68 William St. New York City

Pacific Coast and Western Canada

BAKERSFIELD, CAL. — The city of Bakersfield is planning to construct a water system on the east side to include four or six pumping plants with a capacity of 1,400,000 gallons per day.

SAN FRANCISCO. — Kleiber & Co. are building a 1-story plant at Eleventh and Folson streets for manufacturing automobile trucks.

ALBUQUERQUE, N. M.—Bonds for $400,000 have been voted for the construction of a waterworks system.

ALMOGORDO, N. M.—Bonds for $300,000 have been voted for a waterworks and electric lighting system.

CATHLAMET, WASH.—The Coast Bridge Co., Portland, has been awarded a contract for constructing a 120-foot steel span over the Grays river in Wahkiakum county.

CHEHALIS, WASH.—J. D. Neville, county engineer, is preparing plans for two steel bridges for the county.

KALAMA, WASH. — The plant of the Mountain Timber Co., Kalama, destroyed by fire some time ago, will be reconstructed at a cost of about $250,000.

NORTH YAKIMA, WASH.—A. Guthrie & Co., St. Paul contractors, have been awarded the contracts for the rail construction of the Northern Pacific railroad in the Yakima valley. There will be about 25 miles of construction in all, of which nine and one-half miles will be the White Swan extension, 13½ miles on the Grandview-Gibbon line and 1½ miles on the Cowiche branch.

PASCO, WASH.—It is estimated that $1,000,000 will be spent by the Northern Pacific railroad this year in the vicinity of Grandview, Wash., and on betterments between Pasco and Ellensburg.

SHELTON, WASH.—Charles A. Harmon has purchased the plant of the Shelton Electric Co., and will change the name to the Shelton Light & Power Co. and make considerable extensions.

TACOMA, WASH.—The Atlas Foundry & Machine Co. is constructing a pattern house. The building will be a 3-story concrete structure, and will cost about $4,000.

LEWISTON, IDA.—The city authorities are giving consideration to the question of erecting a hydro-electric power plant in which several neighboring cities will be asked to join.

OREGON CITY, ORE.—The Rasmussen-Grace Co., Bates building, Portland, has been commissioned by the Hawley Pulp & Paper Co., Portland, to prepare plans for a 1,000-horsepower plant at the latter's Oregon City mill.

PORTLAND, ORE.—A contract has been placed with the Williamette Iron & Steel Works and the Northwest Steel Co. for the construction of two modern tramp steamers in behalf of L. Koster of Stayanster, Norway. Each will have 8,800 tons dead weight capacity.

ROSEBURG, ORE.—The people of Roseburg are to vote May 31 on a contract for the timber railroad with Kendall Bros. to be embodied in a charter amendment. The contract provides that the straight construction of the entire road is to be turned over to the city for disposition when completed. The city voted $300,000 some time ago to aid this road, but it was held invalid by the supreme court.

SALEM, ORE.—The Portland Bridge Co. was the low bidder for the construction of the steel bridge to be constructed by Marion county.

SALEM, ORE.—State Engineer John H. Lewis has completed plans for the proposed steel bridge over the Williamette river between Marion and Polk counties. It will consist of four camel-back steel spans, with 138-foot vertical lift span and a reinforced concrete viaduct approach on the Polk county side 850 feet in length. The cost of the steel structure is estimated at $143,000 and the reinforced viaduct at $55,400. This project has been previously reported.

VANCOUVER, B. C.—The Begg Motor Co. will have an addition built at its plant immediately at a cost of $15,000. The Dominion Construction Co., 509 Richards street are the contractors.

SASKATOON, SASK.—The city council is making arrangements for the following works: The erection of an incinerator plant at a cost of $100,000; a switchboard to cost $8,000; boiler feed pumps to cost $2,000; motor converters to cost $16,000, and additions to waterworks plant and system to cost $28,000. The engineer is J. H. Archibald.

New Business in Eastern Canada

ESSEX, ONT.—The Doyle-Dennert Tractor Co. has been incorporated, to build farm tractors, motor vehicles, machinery and tools; $150,000 capital stock; provisional directors, Wm. C. Doyle and Gillette W. Doyle, of Essex, and Edward C. Dennert, Detroit.

FORD CITY, ONT.—The Chalmers Motor Co., Detroit, recently incorporated to manufacture automobiles, etc.; $1,000,000 capital stock; will commence at once to install machinery and rehabilitate the building of the Tate Electric Co., Ford City, in order to commence manufacturing operations at an early date. Clarence A. Pfeffer, Detroit, is vice president of the company.

HAMILTON, ONT.—The Canadian Hart Wheels Co., Burton street east, will start immediately on the erection of an addition to its plant to cost $7,000.

HAMILTON, ONT.—The Byrns Pneumatic Ship Raising Co. has been incorporated, to raise submerged bodies and manufacture and operate the same; $40,000 capital stock; provisional directors, Harry Byrns, Wm. F. Condon, Wm. H. Goff, of Hamilton, and others.

HAMILTON, ONT.—The Burlington Metals Co. has been incorporated, to manufacture copper, brass, bronze, iron and other metals and their products; $40,000 capital stock; provisional directors, Reginald H. Parmenter, Arthur J. Thomson, and Wm. S. Morlock, all of Toronto.

MITCHELL, ONT.—The Mitchell Woollen Mills will build an addition to its factory and install new machinery.

NEW TORONTO, ONT.—The Brown Copper & Brass Rolling Mills Co. is building a plant at New Toronto, Ont., which will represent an outlay of about $150,000. A new addition is also being constructed for the manufacture of shrapnel shells.

NIAGARA FALLS, ONT. — The Pollard Mfg. Co., Welland avenue, will build a foundry to cost $10,000. F. LeBombard is superintendent of the construction work.

NIAGARA FALLS, ONT.—The Canadian Alexite Co. is making arrangements for the construction of a plant on property owned by the Canadian Niagara Power Co., a short distance from Chippewa, which will cost between $75,000 and $100,000. This company is reported to be controlled by the Carborundum Co., Niagara Falls, N. Y. Alexander Fraser, Niagara Falls, Ont.; and Mr. Chorman of Niagara Falls, N. Y., are interested in the company.

OTTAWA, ONT.—The Imperial Motor Co., 150 Albert street, Ottawa, will build an addition to its motor plant. L. H. Roy is manager of the company.

PORT ARTHUR, ONT.—The blast furnaces of the Atikokan Iron Co., will be enlarged so as to have capacity of 250 tons per day. The present capacity of the plant is 100 tons. According to a statement by J. Dix Fraser, manager of the company, the construction work on the addition will be commenced at an early date. Ore will be supplied by the mines at Atikokan.

TORONTO, ONT.—The Garlock Walker Machinery Co. has been incorporated, to build machinery; $47,500 capital stock; provisional directors, Thomas F. H. Giles, John F. McGregor and Harry Riley, all of Toronto.

DRUMMONDSVILLE, QUE. — The Aetna Chemical Co. of Canada has let a contract for the erection of a chemical plant at Drummondsville, to cost $300,000 to the Westinghouse, Church, Kerr Co., of New York.

MONTREAL, QUE.—Automobile Owners Accessory Co. has been incorporated to manufacture automobile accessories; $50,000 capital stock; by Hector F. Cameron, Joseph Jenkins, Agnes F. Foley and others, of Montreal.

MONTREAL, QUE.—The Reliance Foundry has been incorporated to carry on business as founder, machinist and engineer; $50,000 capital stock; by Emilien Daoust, Antonio Valiquette and Joseph A. St. Yves and others, Montreal.

SHERBROOKE, QUE.—E. C. Gatien, secretary-treasurer of the city of Sherbrooke, Que., is receiving bids for a power pump to have a capacity of 4,000,000 imperial gallons per 24 hours at not more than 30 revolutions a minute, to work under a dynamic head of 250 feet; also a vertical water wheel, flume, brackets, shafts, etc., of sufficient size under a head of 11 feet, to operate above mentioned pump.

AMHERST, N. S.—The Ledcote Co. of Canada will establish a plant at Amherst for covering sheets with lead as a substitute for galvanizing.

TRURO, N. S.—The city council will take over the Chalmers electric plant at Truro, to which large additions will be made. The council will be in the market for engines, motors, pumps, boilers, generators, stacks, etc.

New Trade Publications

STEAMBOAT SPECIALTIES.—A 24-page catalog issued by the E. W. Vanduzen Co., Cincinnati, is descriptive of gongs, engine and alarm bells, angles, whistle treadles, bell pulls, sheaves, bell-line stands, standard boards, fire and deck pumps, water gages, boiler compound, syphons, bilge pumps and other accessories.

BELLS AND SIGNAL SYSTEMS.—In a 40-page catolog, the E. W. Vanduzen Co., Cincinnati, describes its numerous types of steamboat bells, alarm balls, etc., also sheaves, angles and treadles for bell lines. Water gages, steam pumps, steam bilge pumps, exhausters, fire pumps and oilers are described and illustrated.

FACING HEADS. — The Mummert-Dixon Co., Hanover, Pa., describes its facing with automatic feed, in a recent pamphlet. Illustrations and descriptions are presented detailing the application of these heads to service on milling machines, lathes and drill presses. A complete description of these heads also is given.

ELECTRICAL INSTRUMENTS. — The Roller-Smith Co., New York, describes its line of electrical instruments for signal testing in a recent pamphlet. This line includes both direct and alternating current portable volt-ammeters and direct reading portable ohmmeters. Each instrument is illustrated and described in detail.

CLAY AND GRAPHITE MIXTURE. — The Joseph Dixon Crucible Co., Jersey City, N. J., has issued a folder devoted to its crucible clay and graphite mixture. The material is said to be of the most refractory nature and may be used for patching furnace linings, ladles and cupolas, and as a cement on gas retort covers. The mixture when mixed with water is ready for use.

HIGH SPEED STEEL.—The Vanadium-Alloys Steel Co., Pittsburgh, has issued a pamphlet describing its high speed steel. The brochure has unusual interest, owing to the directions it contains for the proper use of this steel. These directions include heating for forging, heating for hardening, cooling, and suggestions for hardening without causing scaling or decarbonization.

ELECTRIC HOISTS.—The Economy Engineering Co., Willoughby, O., has issued a 4-page folder descriptive of its electric hoists. Among the features of interest described is the method of inclosed construction which facilitates operation in places where dust and acid fumes prevail. Several different mountings may be employed with the company's hoist, it is said. The folder also includes specifications of the machine.

TOTE BOX.—Th New Britain Machine Co., New Britain, Conn., has issued a circular on metal tote boxes. The boxes are made from 18 gage material and are of one piece construction, except for the handles which are No. 16 gage stock and are welded to the box. The feature of the boxes is the design which permits the nesting of 12 boxes in a vertical space of 18 inches. The weight of each box is seven pounds.

ROLLER BEARINGS.—A 24-page bulletin has been issued by the American Roller Bearing Co., Pittsburgh. It deals with the design and engineering features of the roller bearing manufactured by this company and a description of the various uses to which the product is adapted. The bearings consist of an inner sleeve, load rollers, spacing rollers, and an outer sleeve. They are used extensively in steel mill machinery, farm tractors, ore trucks, power transmission apparatus, traveling cranes, fans, and other types of machinery.

GRAB BUCKETS.—A small 12-page booklet has been issued by the Link-Belt Co., Chicago, describing two types of grab buckets manufactured by the company. The design of one is adapted to use for excavating and handling large run-of-mine coal, crushed stone, gravel, sand and other abrasive materials. It is said to have unusual closing power, and penetrates material easily. The other type is designed for general work. Economy in operation is claimed for it on account of the simple construction. Buckets of both kinds are furnished in capacities from ¾ to 3 cubic yards.

WAGON AND TRUCK LOADERS.—The Link-Belt Co., Chicago, is distributing an attractive 64-page catalog describing wagon and truck loaders for handling coal, coke, stone, sand, and other similar materials. Many types of loaders are listed and illustrated and the various uses to which each particular design is adapted are described. Under the title, "Suggestions for Coal Dealers" are shown a number of systems for handling coal from railroad car to storage plant and to wagon or truck. Wholesale and retail coal pockets and gondola car unloaders are described in the closing pages of the catalog.

CRANES.—The Alliance Machine Co., Alliance, O., has issued an 8 x 11-inch 94-page catalog in which practically all types of machines built by that company are shown. Full-page engravings, supplemented by actual photographs taken in many steel plants, showing ladle cranes, strippers, slab chargers, drawing machines, hook blocks, forge shop manipulators, cantilever extensions and gantry cranes, lend a touch of realism to this catalog. Preceding the illustrations is an alphabetical index of users of two or more of the company's cranes, as well as a list of users classified as to the types of machines which have been installed.

CUT NAILS.—An attractive 32-page booklet descriptive of cut nails has been issued by the La Belle Iron Works, Steubenville, O. Photographs of nails of all sizes and kinds are reproduced and the length, weight, size, etc., of nails are tabulated. Two views of the Wheeling works are shown, indicating the facilities of the company for manufacturing cut nails. The origin of the use of the terms, six penny, eight penny, etc., to designate certain arbitrary sizes of nails is explained. In the fifteenth century these terms denoted the price per hundred. Their original significance was lost in the fluctuation of prices, but was retained to denote sizes.

PUMPS.—The Scranton Pump Co., Scranton, Pa., has published a bulletin describing triplex plunger pumps of the vertical sectional water-end type. The pumps are designed for medium lifts to 500 feet head. They are adapted for use in mine service, for boiler feeding, for circulating brine, for tank supply, elevator service, etc. Several pages of the bulletin are devoted to a description of features of construction. Power may be transmitted to the pump by means of tight and loose pulleys on a countershaft driven by a belt from line shaft, motor or engine; or by high-ratio single-speed reduction drive from a motor.

PLATES, SHEETS AND ROOFING.—La Belle Iron Works, Steubenville, O., is distributing a 40-page catalog describing its line of plates, sheets and roofing. The product illustrated and described includes sheared, grooved, rolled and light plates; blue annealed, black and galvanized sheets; corrugated roofing and siding; crimped, pressed standing seam and plain and self-capping roll roofing. A number of pages are given over to tables which will prove of value to the consumer of these products. These tables include standard weights per square for roofing and siding, bundling tables for black and galvanized sheets, tables showing the thickness in inches of different gages, and metric conversion tables.

GAS AND AIR METERS.—The Builders Iron Foundry, Providence, R. I., has issued a booklet devoted to its line of gas and air meters for station and industrial service. In addition to a complete presentation of the operating principles of these meters, the booklet describes the various types of indicating and recording instruments employed for different classes of service in the gas industry. The gas meter is based upon the law of the conservation of energy. This meter is said to be applicable to the measurement of all gases and liquids flowing in pipes. The booklet is illustrated with service views together with diagrams showing the design of the meters and recording instruments. Several valuable tables are given.

SAFETY GOGGLES.—A series of posters used in the plants of several large manufacturing concerns to caution employes against the performance of dangerous work without the protection of goggles has been reproduced by the Julius King Optical Co., New York. One of the series is a bulletin of cartoons designed by an employe of the Globe plant of the American Smelting & Refining Co., Denver, Col. Each picture shows a case in which the workman should use goggles. Bulletins used by the American Car & Foundry Co., contrast the result of negligence and of care. In the former case a man took a chance and lost the sight of one eye; in the latter, a man wearing goggles was hit by a 2-pound rivet set. The goggles prevented the blow from injuring the eye.

FLOOR CRANES AND HOISTS. — The Canton Foundry & Machine Co., Canton, O., has issued a 34-page booklet descriptive of a portable floor crane and hoist. The curved arm which supports the upper shieve wheel rests on a U-shaped base which is mounted on four wheels. The front wheels are mounted on an eccentric axle which is so designed that when the handle is raised in a vertical position the weight of the hoist is shifted from the wheels to two legs which furnish solid support. The hoisting mechanism consists of a lifting crank and gear which engages a gear on a drum. The chain passes from the drum over a shieve wheel, down to the block and hook and back to a point on the arm, where it is fastened. The load may be held at any point by means of a pawl and ratchet. The hoist is adapted for use in locomotive shops and in plants where medium weight articles are lifted and carried short distances.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Lower price to July 1; higher to Jan. 1.)

Bessemer valley	$21.00 to 21.50
Basic, Pittsburgh	18.95 to 19.20
Basic, Pittsburgh	19.20
Basic, eastern Pa.	20.50 to 21.00
Basic, Buffalo	19.50 to 20.00
Malleable, Pittsburgh	19.45 to 19.95
Malleable foundry, Chicago	19.50
Malleable foundry, Philadelphia	21.50 to 21.75
Malleable foundry, Buffalo	19.00 to 20.00
No. 1X foundry, Philadelphia	21.00 to 21.50
No. 2 foundry, Pittsburgh	19.45 to 19.95
No. 2 foundry, Cleveland	19.30 to 19.80
No. 2 foundry, Ironton	18.50 to 19.00
No. 2 foundry, Chicago	19.00
No. 2X foundry, Philadelphia	20.50 to 21.00
No. 2X foundry, N. J. tidewater	20.50 to 21.00
No. 2X foundry, Buffalo	19.00 to 19.50
No. 2 plain, Philadelphia	20.00 to 20.50
No. 2 plain, N. J. tidewater	20.00 to 20.50
No. 2 plain, Buffalo	18.75 to 19.00
No. 2 southern, Birmingham	15.00 to 15.50
No. 2 southern, Cincinnati	17.90 to 18.40
No. 2 southern, Chicago	19.50 to 20.00
No. 2 southern, Phila. delivery	20.00 to 20.50
No. 2 southern, Cleveland	19.00 to 19.50
No. 2 southern, New York docks	19.00 to 19.50
No. 2 southern, Boston docks	19.25 to 19.75
No. 2 south. interior, New Eng.	20.00 to 21.00
No. 2 southern, St. Louis	18.40 to 18.90
Virginia No. 2X, furnace	18.50
Virginia 2X, Philadelphia	21.25
Virginia No. 2X, Jersey City	21.00
Virginia 2X, Boston points	21.75
Gray forge, eastern Pa.	19.50
Gray forge, Pittsburgh	18.95
Gray forge, Birmingham	14.00 to 14.50
Silveries, 8 per cent, furnace	29.00
Silveries, 8 per cent, Chicago	31.50
Low phos. Standard, Phila.	34.00 to 35.00
Low phos. Lebanon, Pa. furnace	30.00 to 32.00
Low phos. Pittsburgh	30.00 to 31.00
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	19.75 to 22.25
Charcoal, Buffalo	21.00 to 22.00
Charcoal, Birmingham	22.50 to 23.00

IRON ORE

Lake Superior Ores.
(Lower Lake Ports.)

Old range Bessemer, 55 per cent, ton	$4.45
Mesabi Bessemer, 55 per cent, ton	4.20
Old range non-Bess., 51½ per cent, ton	3.70
Mesabi non-Bess., 51½ per cent, ton	3.55

Eastern Ores.
(Per unit delivered eastern Pennsylvania.)

Pt. Henry fur., 60 per cent, unit	8.5c to 8.9c
Local N. Y. and N. J. ores, unit	8.5c to 8.75c
Port Henry lump, at mines, ton	$4.00

Foreign Ores.
(Per unit Philadelphia.)
(Prices nominal.)

Foreign Bess., 50 to 65 per cent	8 to 8½
For'n non-Bess., 50 to 65 per cent	8 to 8½

COKE

(At the ovens.)

Connellsville furnace (nom.)	$2.25 to 2.50
Connellsville fur., contract	2.90 to 3.00
Connellsville foundry, contract	3.50 to 3.75
Connellsville foundry	3.50 to 3.75
Wise county furnace, contract	3.00 to 3.25
Wise county foundry, contract	3.50 to 3.75
Pocahontas foundry, contract	3.25 to 3.75
Pocahontas furnace, contract	3.00 to 3.25
New River foundry, contract	3.75 to 4.25
New River furnace, contract	3.25 to 3.50

FERRO ALLOYS AND STEEL MAKING METALS

Ferro manganese, 80 per cent, seaboard, prompt	$4.00 to 4.50
Ferro manganese, 80 per cent, seaboard, contract	175
Spiegel, 20 per cent, furnace, prompt and 2nd quarter	80.00 to 100.00
Spiegel, 20 per cent, fur., last half	60.00 to 65.00
Ferro-silicon, 50 per cent, Phil.	83.00 to 85.00
Ferro-silicon, 50 per cent, Pbgh.	83.00 to 85.00

Bessemer ferro-silicon, 9 per cent to 10 per cent, $32.00; 10 to 11 per cent, $33.00; 11 to 12 per cent, $34.00; 12 to 13 per cent, $35.00 a ton at the furnace at Ashland, Jackson and New Straitsville, O.

Ferro-carbon titanium, 8 to 12½ cents per pound in carloads.

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama canal, per 100 lbs., in carload lots, exclusive for insurance and dockage.

From New York	$0.40
From Pittsburgh	.619
From Youngstown	.619
From Niles	.619
From Wheeling	.619
From Steubenville	.619
From Johnstown	.604
From Coatesville	.545
From Steelton	.555
From Bethlehem	.529
From Cleveland	.65
From Chicago	.765

SEMI-FINISHED MATERIAL

Open hearth billets, Phila.	$50.00 to 55.00
Forging billets, Phila.	65.00 to 70.00
Forging billets, Pbgh., nominal	65.00 to 70.00
Forging billets, Chicago	65.00
Wire rods, Pittsburgh (nom.)	60.00 to 65.00
Bessemer billets, Youngstown	45.00 to 50.00
Bessemer billets, Pittsburgh	45.00 to 50.00
Open hearth billets, Pittsburgh	45.00 to 50.00
Open hearth billets, Youngstown	45.00 to 50.00
Bess. sheet bars, Youngstown	45.00 to 50.00
Op. h'th sheet bars, Youngstown	45.00 to 50.00
Bess. sheet bars, Pittsburgh	45.00 to 50.00
Open hearth sheet bars, Pbgh.	45.00 to 50.00
Muck bar, Pittsburgh (nominal)	40.00 to 45.00

SKELP

Grooved steel skelp	2.50c
Sheared steel skelp	2.75c

RAILS AND TRACK MATERIAL

Stand. Bess. rails, Pbgh. & Chg.	1.25c
Stan. op-h'th rails, Pbgh. & Chg.	1.34c
Stand. Bess. rails, Pbgh. & Chg. delivery after May 1, 1917	1.47½c
Stan. op-h'th rails, Pbgh. & Chg. delivery after May 1, 1917	1.56½c
Light rails, 8 to 10 lbs., Pbgh.	2.25c
Light rails, 8 lb., Chicago	1.95c
Light rails, 12 to 14 lbs., Pbgh.	2.20c
Light rails, 12 lbs., Chicago	1.90c

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—

Cleveland	$0.95
Newark, N. J.	2.98
Boston	3.18
Philadelphia	2.78
Pittsburgh	.95
St. Louis	3.18

Buffalo to:—

Albany, N. Y.	$1.26
New England (all rail)	2.58
New York and Brooklyn (all rail)	2.58
New York and Brooklyn (by canal	1.25 to 1.60

Virginia furnaces to:—

Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88

Birmingham, Ala., to:—

Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
New York (all rail)	6.15
New York (r. and w.)	4.25
Philadelphia (all rail)	5.20
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75

Chicago to:—

Des Moines	$2.80
Milwaukee	.50
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58

Ironton and Jackson, O., to:—

Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58

Light rails, 16 to 20 lbs., Pbgh.	2.15c
Light rails, 16 to 20 lbs., Chgo.	1.85c
Light rails, 25 to 45 lbs., Pbgh.	2.10c
Light rails, 25 to 45 lbs., Chgo.	1.80c
Relaying rails, standard, Pbgh. and Chicago	$23.00 to 24.00
Relaying rails, light, Chicago	24.00 to 25.00
Angle bars, st. sect., Pbgh. base	1.50c to 1.75c
Angle bars, st. sections, Chgo.	1.50c to 1.75c
Spikes, railroad, Pittsburgh	2.65c to 2.75c
Spikes, railroad, Chicago	2.75c to 2.90c
Track bolts, Pittsburgh	3.25c
Track bolts, Chicago	3.25c to 3.50c
Tie plates, Chicago	50.00 to 55.00

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	2.75c to 3.25c
Structural shapes, Pbgh. (con.)	2.50c to 2.75c
Structural shapes, Philadelphia	2.659c to 3.159c
Structural shapes, Chgo.	2.69c to 3.29c
Structural shapes, New York	2.669c to 3.169c
Tank plates, Chgo.	3.09c to 3.49c
Tank plates, Pittsburgh (con.)	2.75c to 3.00c
Tank plates, Pittsburgh	3.00c to 4.25c
Tank plates, Philadelphia	2.909c to 3.909c
Tank plates, New York	2.919c to 3.919c
Bars, soft steel, Chicago	2.69c to 3.29c
Bars, soft steel, Pbgh. (con.)	2.50c to 2.75c
Bars, soft steel, Pittsburgh	2.75c to 3.25c
Bars, soft steel, New York	2.669c to 3.169c
Bars, soft steel, Philadelphia	2.659c to 3.159c
Hoops, carloads, Pittsburgh	2.75c
Bands, Pittsburgh	2.50c
Shafting, Pbgh., contr. carloads	10 to 20 off
Bar iron, Chgo.	2.35c to 2.50c
Bar iron, Philadelphia	2.559c
Bar iron, Cleveland	2.25c
Bar iron, New York	2.569c
Bar iron, Pittsburgh	2.65c to 2.75c
Hard steel bars, Chgo.	2.50c to 2.75c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	2.90c to 3.00c
No. 28, black, Chicago	3.09c to 3.19c
No. 28, tin mill, black, Pbgh.	2.90c to 3.00c
No. 28, galvanized, Pbgh.	4.85c to 5.25c
No. 28, galvanized, Chgo.	5.19c
No. 10, blue annealed, Pbgh.	3.00c to 3.25c
No. 10, blue annealed, Phila.	3.659c to 4.159c
No. 10, blue annealed, Chgo.	3.19c to 3.29c
Tin plate, 100 lb., coke base	$5.00 to $5.25

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickl'd, cold roll. and re-anld.	30 cents
Hot roll'd pickled and anl., tin mill.	25 cents
Full pickled, cold rolled and re-anld.	50 cents
Auto sheets	75 cents
Blue stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller leveling	10 cents
Patent leveling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxiding	10 cents
Lime finish	10 cents
Open-hearth stamping steel, free fr. mill scale	55 cents
Special open-hearth deep stpg. steel free from mill scale	80 cents
Extra deep special auto body stock	1.25
Ext. for 28 gage ov. 32 to 36-in. wide	10 cents

No reduction for sheets not annealed.

The above extras apply on both sheet and tin mill specifications, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

		Black. Butt.-weld.	Galv. weld.
Steel, ¾ to 3	inches	70	50½
Iron, ¾ to 1½	inches	60	38
		Lap-weld.	
Steel, 2½ to 6	inches	68	48½

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	56
Iron, 3½ to 4½ inches, l. c. l.	44

WIRE PRODUCTS

(Retailers' price 5 cents above jobbers' quotations.)

Wire nails, jobbers', Pittsburgh	$2.50
Plain wire, jobbers', Pittsburgh	2.45
Galvanized wire, jobbers', Pbgh.	3.15
Polished staples, Pbgh.	2.65
Galvanized staples, Pbgh.	3.35
Barb wire, painted, jobbers', Pbgh.	2.65
Barb wire, galv., jobbers', Pbgh.	3.35

IRON AND STEEL PRICES

Corrected up to Tuesday noon

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller or shorter, rolled thread, 50, 10 and 5, cut threads 50 and 5; larger or longer, 40 and 5.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller or shorter, rolled 50, 10 and 10; cut, 50 and 10; larger or longer, 40, 10 and 5.

Cold pressed, semi-finished hexagon nuts, 60 and 10.

Gimlet and cone point lag bolts, 60. Hot pressed square, blank or tapped nuts, $2.90 off list; hot pressed hexagon blank or tapped, $2.90.

Cold pressed square, blank or tapped, $2.60 off; hexagon, blank or tapped, all sizes, $3.00.

RIVETS

Structural rivets, Pbgh.	3.75c
Structural rivets, Chgo. delivery	3.30c
Boiler rivets, Pbgh.	3.85c
Boiler rivets, Chgo. delivery	3.40c

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	2.50c

STANDARD STEEL CHAIN

Chain, ⅜ inch proof coil	5.00c

COLD ROLLED STRIP STEEL

Base price 6.00c to 6.25c per 100 pounds, hard, coils 1½ inches and wider and by .100 inches and heavier.

Extra for Thickness.

0.100-inch and thicker	Base
0.050 to 0.099	$0.05
0.036 to 0.049	0.20
0.035	0.20
0.031 to 0.034	0.35
0.026 to 0.030	0.45
0.020 to 0.024	0.55
0.025	0.45
0.017 to 0.019	1.35
0.015 to 0.016	1.75
0.013 to 0.014	2.45
0.012	2.80
0.011	3.15
0.010	3.50

Other extras as per card of March 15, 1916.

CAST IRON WATER PIPE

Four-inch, Chicago	$33.50 to 34.00
Six-inch and larger, Chicago	30.50 to 31.00
Six-inch Class B, New York	30.50
Four-inch, Class B, New York	33.50
Four to six-inch, Birmingham	28.00 to 29.00
Six-inch and larger, Birmingham	25.00 to 26.00

Light weight water and gas pipe $1 per ton higher than standard water.

WAREHOUSE PRICES

Steel bars, Chicago	3.10c
Steel squares, 2-in. & ov., Cleve.	3.75c
Steel rounds, 2-in. & ov., Cleve.	3.75c
Steel bars, under 2 in., Cleveland	3.25c
Steel bars, Philadelphia	3.25c to 4.10c
Steel bars, New York	3.25c
Steel bars, St. Louis	3.15c
Steel bars, Cincinnati	3.20c to 3.75c
Steel bars, St. Paul	3.20c
Steel bars, over 2-in., Buffalo	3.90c
Steel bars, Buffalo	3.20c
Iron bars, Chicago	3.10c
Iron bars, Cleveland	3.20c
Iron bars, St. Louis	2.75c
Iron bars, Cincinnati	3.20c to 3.75c
Iron bars, Philadelphia	3.00c to 3.25c
Iron bars, New York	3.10c
Shapes, Chgo.	3.10c
Shapes, St. Louis	3.15c
Shapes, St. Paul	3.20c
Shapes, New York	3.25c
Shapes, Cleveland	3.25c
Shapes, Philadelphia	3.00c to 3.50c
Shapes, Buffalo	3.20c
Shapes and plates, Cincinnati	3.20c to 3.50c
Plates, Chgo.	3.50c
Plates, St. Louis	3.55c
Plates, St. Paul	3.60c
Plates, New York	4.25c
Plates, Cleveland	3.65c
Plates, Philadelphia	4.00c
No. 10 blue anl. sheets, Chgo.	3.40c
No. 10 blue anl. sheets, Cleve.	3.50c
No. 10 blue anl. sheets, Buffalo.	3.25c
No. 10 blue anl. sheets St. L.	3.45c
No. 10 blue anl. sheets, Cinci.	3.50c
No. 10 blue anl. sheets, St. Paul	3.50c
No. 28 black sheets, Chgo.	3.20c
No. 28 black sheets, Cleveland.	2.95c
No. 28 black sheets, Cinci.	3.95c
No. 28 black sheets, St. Louis	3.20c
No. 28 black sheets, St. Paul	3.35c
No. 28 galv. sheets, Chgo.	5.25c to 5.50c
No. 28 galv. sheets, Cleveland.	5.25c
No. 28 galv. sheets, Cincinnati	5.65c
No. 28 galv. sheets, St. Louis	5.25c to 5.50c

Freight Rates, Coke

Connellsville district, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.85
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

IRON AND STEEL SCRAP

(Net Tons.)

Angle bars, iron, Chicago	$18.50 to 19.00
Angle bars, steel, St. Louis	14.25 to 14.75
Arch bars and transoms, Chgo.	19.50 to 20.00
Arch bars and transoms, St. L.	20.00 to 20.50
Boiler plate, cut, No. 1, Chgo.	11.25 to 11.75
Boiler plate, cut, No. 1, St. L.	9.50 to 10.00
Boiler punchings, Chicago	14.00 to 14.50
Bundled sheet, Cincinnati	8.50 to 9.00
Busheling, No. 1, Chicago	13.75 to 14.25
Busheling, No. 1, Cincinnati	10.50 to 11.00
Busheling, No. 1, Cleveland	14.00 to 14.25
Busheling, No. 1, St. Louis	12.75 to 13.25
Busheling, No. 2, Chicago	9.75 to 10.25
Cast borings, Chicago	7.25 to 7.75
Cast borings, Cincinnati	7.50 to 8.00
Cast borings, Cleveland	8.00 to 8.50
Cast borings, St. Louis	7.00 to 7.25
Cast, No. 1, Chicago	12.75 to 13.25
Cast, No. 1, Cincinnati	11.50 to 12.00
Cast, No. 1, Cleveland	14.25 to 14.50
Cast, No. 1, St. Louis	13.50 to 14.00
Cast, No. 1, Birmingham	11.00 to 11.50

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 lbs. to:—	
New York	16.9 cents
Philadelphia	15.9 cents
Boston	18.9 cents
Buffalo	11.6 cents
Baltimore	15.4 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Minneapolis and St. Paul	32.9 cents
Denver	68.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama canal	61.9 cents

Cut forge, Chicago	15.25 to 15.75
Knuckles, coup., Chicago	15.50 to 16.00
Knuckles, coup., St. Louis	15.50 to 16.00
Locomotive tires, Chicago	19.00 to 19.50
Locomotive tires, St. Louis	18.00 to 18.50
Machine shop turnings, Chgo.	7.00 to 7.50
Machine shop turnings, Cleve.	8.00 to 8.50
Machine shop turnings, Cinci.	7.00 to 7.50
Machine shop turnings, St. L.	7.75 to 8.00
Malleable agricultural, Chgo.	12.00 to 12.50
Malleable agricultural, St. Louis	12.00 to 12.50
Malleable, Cincinnati	8.50 to 9.00
Malleable railroad, Chicago	13.50 to 14.00
Malleable railroad, St. Louis	13.00 to 13.50
Pipes and flues, Cleve. (nom.)	13.00 to 13.75
Pipes and flues, Chicago	12.25 to 12.75
Pipes and flues, St. Louis	12.00 to 12.50
Railroad wrought, No. 1, Chgo.	16.75 to 17.25
Railroad wrought, No. 1, Cleve.	18.00 to 18.50
Railroad wrought, No. 1, St. L.	16.50 to 17.00
Railroad wrought, No. 1, Cinci.	12.75 to 13.25
Railroad wrought, No. 2, Chgo.	15.25 to 15.75
Railroad wrought, No. 1, St. L.	17.00 to 17.50
Shafting, St. Louis	17.00 to 17.50
Springs, St. Louis	15.50 to 16.00
Springs, Chicago	16.50 to 17.00
Steel car axles, Birmingham	18.50 to 19.00
Steel car axles, St. Louis	26.00 to 26.50
Steel car axles, Chicago	25.50 to 26.00
Stove plate, Chicago	11.25 to 11.75
Stove plate, Cleveland	11.25 to 11.50
Stove plate, Buffalo	11.50 to 12.00
Stove plate, Cincinnati	8.00 to 8.50
Stove plate, St. Louis	9.50 to 10.00
Stove plate, Birmingham	10.00 to 10.50

(Gross tons.)

Busheling, No. 1, Buffalo	15.00 to 15.50
Busheling, No. 1, Pittsburgh	15.00 to 15.50
Busheling, No. 2, Buffalo	12.00 to 12.50
Bundled sheets, Pittsburgh	15.00
Bundled sheets, Cleveland	12.75 to 13.25
Bundled sheets, Buffalo	13.00 to 13.50
Car wheels (iron), Pittsburgh	15.50 to 16.00
Car wheels (steel), Pittsburgh	18.00 to 18.50
Car wheels, Chicago	13.50 to 13.75
Car wheels, eastern Pa.	17.00 to 17.50
Car wheels, Buffalo	15.25 to 15.75
Car wheels, N. Y.	15.00 to 15.50
Car wheels, St. Louis	13.00 to 13.50
Car wheels, Birmingham	12.50 to 13.00
Cast borings, New York	9.00 to 9.25
Cast borings, eastern Pa.	10.50 to 11.00
Cast borings, Buffalo	9.25 to 9.75
Cast borings, Pittsburgh	10.50 to 11.00
Cast, No. 1, eastern Pa.	17.50 to 18.00
Cast, No. 1, Pittsburgh	16.50
Cast, heavy No. 1, N. J. points	18.00 to 18.25
Forge, No. 1, eastern Pa.	15.00 to 15.50
Frogs, switches, guards, St. L.	15.75 to 16.25
Frogs, switches, guards, St. L.	16.50 to 17.00
Grate bars, Buffalo	12.00 to 12.50
Grate bars, N. J. points	13.50 to 13.75
Heavy axle turnings, Buffalo	12.50 to 13.00
Heavy melting steel, Pbgh.	17.50 to 18.00
Heavy melting steel, Buffalo	17.50 to 18.00
Heavy melting steel, Chicago	16.75 to 17.00
Heavy melting steel, Cleveland	16.75 to 17.00
Heavy melting steel, Cincinnati	13.75 to 14.25
Heavy melting steel, eastern Pa.	17.50 to 18.00
Heavy melting steel, New York	15.50 to 15.75
Heavy melting steel, St. Louis	16.00 to 16.50
Heavy melting steel, B'ham	11.25 to 11.75
Iron rails, Chicago	19.00 to 19.50
Iron rails, Buffalo	18.00 to 18.50
Iron rails, Cincinnati	14.00 to 14.50
Iron rails, St. Louis	17.25 to 17.75
Iron rails, Cleveland (nom.)	17.00 to 18.00
Iron axles, Pittsburgh	27.50
Iron axles, Cincinnati	20.50 to 21.00
Iron axles, eastern Pa.	27.00 to 28.00
Iron axles, Chicago	26.75 to 27.75
Iron axles, St. Louis	23.00 to 23.50
Iron axles, Buffalo	24.00 to 24.50
Low phos. steel, Buffalo	21.00 to 21.50
Low phos. steel, Pbgh.	21.50
Low phos. steel, eastern Pa.	22.50 to 23.00
Machine shop turnings, Buffalo.	8.50 to 9.00
Mch. shop turnings, New York.	8.25 to 8.75
Mch. shop turnings, Pbgh.	10.50 to 11.00
Mch. shop turnings, eastern Pa.	11.00 to 11.50
Malleable railroad, Cleveland	17.25 to 17.50
Malleable railroad, Buffalo	16.00 to 16.50
Malleable railroad, Pittsburgh	16.25 to 16.50
Malleable railroad, eastern Pa.	14.50 to 15.00
R. R. and mch. cast, No. 1, Bfl.	16.00 to 16.50
R. R. wrought, No. 1, Buffalo	19.00 to 19.50
R. R. wrgt., No. 1, eastern Pa.	23.00 to 23.50
R. R. wrgt., No. 1, New York	21.00 to 21.50
R .R. wrought, No. 1, Pbgh.	19.00 to 19.50
Reroll. rails, 5 ft. & ov., Pbgh.	18.25
Reroll. rails, 5 ft. & ov., Chgo.	17.25 to 17.75
Reroll. rails, 5 fe. & ov., Cleve.	16.75 to 17 00
Reroll. rails, 5 ft. & ov., E. Pa.	19.00 to 20.00
Reroll. rails, 5 ft. & ov., St. L.	17.75 to 18.25
Reroll. rails, 5 ft. & ov., B'ham	14.00 to 14.50
Shafting, New York	19.50 to 20.00
Shafting, eastern Pa.	22 00 to 23.00
Shoveling steel, Chicago	15.75 to 16.25
Shoveling steel, St. Louis	14.00 to 14.50
Steel rails, short, Chicago	17.50 to 18.00
Steel rails, short, Cleveland	18.25 to 18.50
Steel rails, short, St. Louis	16.00 to 16.25
Steel car axles, New York	22.00 to 23.00
Steel car axles, Buffalo	24.00 to 24.50
Steel car axles, Cleveland	25.00 to 25.50
Steel car axles, Pittsburgh	25.00 to 26.00
Steel car axles, eastern Pa.	25.00 to 26.00
Stove plate, N. J. points	13.50 to 13.75
Stove plate, Pittsburgh	12.00 to 12.25
Stove plate, eastern Pa.	13.50 to 14.00
Wrought pipe, New York	12.75 to 13.25
Wrought pipe, eastern Pa.	14.50 to 15.00
Wrought pipe, Buffalo	14.00 to 14.50

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Blackwell, Geo. G., Sons & Co., Ltd., Liverpool, Eng.
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ALUMINUM.
(Granulated.)
United Smelt'g & Alum. Co., New Haven, Ct.

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United Smelt'g & Alum. Co., New Haven, Ct.

ALUMINUM RODS.
(Sheet.)
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ANNEALING BOXES AND POTS.
Mesta Machine Co., Pittsburgh, Pa.
Pittsburgh Annealing Box Co., Pittsburgh, Pa.
Pittsburgh Malleable Iron Co., Pittsburgh, Pa.
Pittsburgh Valve Foundry & Const. Co., Pittsburgh, Pa.
Swedish Crucible Steel Co., Detroit, Mich.
United Engrg. & Foundry Co., Pittsburgh, Pa.
Zanesville Malleable Iron Co., Zanesville, O.

ARMATURES.
Crocker-Wheeler Co., Ampere, N. J.
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ASH BUCKETS.
Lakewood Engrg. Co., Cleveland, O.

AXLES.
American Bridge Co., New York City.
Bethlehem Steel Co., So. Bethlehem, Pa.
Cambria Steel Co., Philadelphia, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Illinois Steel Co., Chicago, Ill.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
National Tube Co., Pittsburgh, Pa.
Otis Steel Co., Cleveland, O.

BABBITT METAL.
Lubricating Metal Co., The, New York City.

BAKERS, WIRE COATING.
Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

BALLS.
(Steel.)
Bethlehem Steel Co., The, So. Bethlehem, Pa.
New Departure Mfg. Co., Bristol, Conn.

BANDS.
(Steel.)
Carnegie Steel Co., Pittsburgh, Pa.

BARGES.
(Steel.)
American Bridge Co., New York City.

BARRELS, TUMBLING.
(Wire Nails.)
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

BARS—ALLOY.
Central Steel Co., The, Massillon, O.

BARS.
(Concrete Reinforcing.)
Bourne-Fuller Co., Cleveland, O.
Cambria Steel Co., Philadelphia, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Cincinnati Iron & Steel Co., Cincinnati, O.
Franklin Steel Works, Franklin, Pa.
Inland Steel Co., Chicago, Ill.
Laclede Steel Co., St. Louis, Mo.
Ryerson, Jos. T., & Son, Chicago, Ill.
Trussed Concrete Steel Co., Detroit, Mich.
Upson Nut Co., Cleveland, O.

BARS.
(Iron and Steel.)
American Bridge Co., New York, N. Y.
American Iron & Steel Mfg. Co., Lebanon, Pa.
Belmont Iron Works, Philadelphia, Pa.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Bourne-Fuller Co., Cleveland, O.
Brown-Wales Co., Boston, Mass.
Carnegie Steel Co., Pittsburgh, Pa.
Cincinnati Iron & Steel Co., Cincinnati, O.
Franklin Steel Works, Franklin, Pa.
Harvey, Arthur C., Co., Boston, Mass.
Illinois Steel Co., Chicago, Ill.
Illinois Steel Co., Warehouse Dept., Chicago, Ill
Illinois Steel Warehouse Co., St. Louis, Mo.
Illinois Steel Warehouse Co., St. Paul, Minn.
Inland Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lackawanna Steel Co., Buffalo, N. Y.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Milton Mfg. Co., Milton, Pa.
Punxsutawney Iron & Steel Co., Punxsutawney, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.
Standard Gauge Steel Co., Beaver Falls, Pa.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Trussed Concrete Steel Co., Detroit, Mich.
United Steel Co., Canton, O.
Upson Nut Co., Cleveland, O.

BEAMS, CHANNELS AND ANGLES.
Belmont Iron Works, Philadelphia, Pa.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Bourne-Fuller Co., Cleveland, O.
Cambria Steel Co., Philadelphia, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.

BEARINGS.
(Ball.)
New Departure Mfg. Co., Bristol, Conn.

BEARINGS.
(Vanadium Steel.)
American Vanadium Co., The, Pittsburgh, Pa.

BELLS.
(Marine and Locomotive.)
Van Duzen, E. W, Co., The, Cincinnati, O.

BELT CEMENT AND DRESSING.
Dixon, Jos., Crucible Co., Jersey City, N. J.
Graton & Knight Mfg. Co., Worcester, Mass.
Texas Company, The, New York City.
Williams, I. B., & Sons, Dover, N. H.

BELT LACING.
(Leather.)
Chicago Rawhide Mfg. Co., Chicago, Ill.
Graton & Knight Mfg. Co., Worcester, Mass.
Williams, I. B., & Sons, Dover, N. H.

BELTING.
(Chain.)
Link-Belt Co., Chicago, Ill.

BELTING—LEATHER.
Chicago Rawhide Mfg. Co., Chicago, Ill.
Graton & Knight Mfg. Co., Worcester, Mass.
Williams, I. B., & Sons, Dover, N. H.

BELTS.
(Conveyor, Rubber.)
Goodyear Tire & Rubber Co., Akron, O.

BENCHES.
(Steel.)
New Britain Mach. Co., New Britain, Conn.

BENCHES AND FRAMES.
(Drawing.)
Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., The, Cuyahoga Falls, O.

BENDING AND STRAIGHTENING MACHINES.
Abramsen Engrg. Co., Pittsburgh, Pa.
Bertsch & Co., Cambridge City, Ind.
Birdsboro St'l Fdy. & Mch. Co., Birdsboro, Pa.
Cleveland Punch & Shear Works Co., Cleveland, O.
Covington Machine Co., Covington, Va.
Espen-Lucas Machine Works, Philadelphia, Pa.
Hinman, D. A., & Co., Sandwich, Ill.
Hydraulic Press Mfg. Co., Mt. Gilead, O.
Mackintosh, Hemphill & Co., Pittsburgh, Pa.
Niles-Bement-Pond Co., New York, N. Y.
United Engrg. & Fdy. Co., Pittsburgh, Pa.
Watson-Stillman Co., New York, N. Y.

BENZOL RECOVERY PLANTS.
Hansen, Pavitt & Jensen, New York City.
Koppers, H., Co., Pittsburgh, Pa.

BILLETS.
Andrews Steel Co., The, Newport, Ky.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Bourne-Fuller Co., Cleveland, O.
Cambria Steel Co., Philadelphia, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Central Steel Co., The, Massillon, O.
Illinois Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
La Belle Iron Works, Steubenville, O.
Lackawanna Steel Co., Buffalo, N. Y.
Otis Steel Co., Cleveland, O.
Republic Iron & Steel Co., Youngstown, O.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Upson Nut Co., Cleveland, O.
Whitaker-Glessner Co., Portsmouth Works, Portsmouth, O.
Wood, Alan, Iron & Steel Co., Philadelphia.
Youngstown Sheet & Tube Co., Youngstown.

BLAST FURNACE SKIP CARS.
Lakewood Engrg. Co., Cleveland, O.

BLAST FURNACE VOLUME METERS.
Clark, Chas. J., Chicago, Ill.

BLOCKS.
Bethlehem Steel Co., The, So. Bethlehem, Pa.

BLOOMS.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Bourne-Fuller Co., Cleveland, O.
Cambria Steel Co., Philadelphia, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Hillman, J. H., & Sons, Pittsburgh, Pa.
Illinois Steel Co., Chicago, Ill.
La Belle Iron Works, Steubenville, O.
Lackawanna Steel Co., Buffalo, N. Y.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Upson Nut Co., Cleveland, O.
Wood, Alan, Iron & Steel Co., Philadelphia.
Youngstown Sh't & Tube Co., Youngstown, O.

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